

# **FACILITIES CRITERIA (FC)**

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## **FACILITY PLANNING FOR NAVY AND MARINE CORPS SHORE INSTALLATIONS**



## FOREWORD

This publication, *Facility Planning for Navy and Marine Corps Shore Installations* (FC 2-000-05N formerly known as UFC 2-000-05N and the P-80), provides facility planning criteria for use in computing quantitative facility requirements for Navy and Marine Corps installations. This document was reformatted from the October 1982 P-80 document on 31 January 2005 and in accordance with the standards for Unified Facilities Criteria (UFC). Since that time the facility planning criteria has been determined not unified among the various DoD services. Therefore, UFC 2-000-05N was changed to a Facilities Criteria (FC) document on 02 March 2023. The criteria are regularly updated to address emergent facility planning issues. The document includes planning criteria and data applicable to those categories of facilities to which a planning factor or data can be applied for computing facility requirements.

Planning criteria contained in this publication are used in the preparation of Basic Facility Requirements, evaluation of existing assets and the determination of specific facility requirements for shore facilities programs. These criteria apply equally to proposed and existing facilities. Their application to existing facilities provides a basis for planning against deficiencies or disposition of excess property as appropriate.

This Foreword and Chapter 1 include the authority and responsibilities of the Naval Facilities Engineering Command for the preparation and publication of planning criteria for use in calculating facility requirements at Navy and Marine Corps Installations and describe the use and applicability of the facility planning factors. The following sections contain a compilation of planning data and related space criteria developed by the Naval Facilities Engineering Command, furnished by systems commands, bureaus and offices of the Department of the Navy and issued by the Secretary of Defense. Planning criteria are established as a guide and normally will be considered as maximum for facilities listed.

The systems for updating this publication will minimize inconsistencies or contradictions with other applicable current directives. Users are invited to call to the attention of the [Planning Criteria Managers](#) any criteria requiring updating, clarification, or revisions due to error.

This publication and its appendices can be found at:

<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/fc-2-000-05n>.

In all cases the material on the website is considered the most up to date. This publication is certified as an official publication of the Naval Facilities Engineering System Command.

# CHAPTER 1 INTRODUCTION

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## 1-1 PURPOSE OF PUBLICATION

This Facility Criteria publication, FC 2-000-05N was formerly designated as FC 2-000-05N under the same title. It provides the space planning factors, criteria and techniques for use in developing Basic Facility Requirement (BFR) calculations and assessments. Establishing the BFR provides the space demand or support requirement for shore-based facilities, by category code, necessary to perform the peacetime missions of Navy shore activities. A BFR justification is the calculation of an installation, command, or region's facilities allowances based upon established planning criteria. The BFR calculation can be modified (with justification) to accommodate site-specific or unit-specific loading requirements, such as mission, personnel, functions and equipment.

BFRs encompass entire functional categories of use, such as administrative offices, general warehouses or public works shops, for both host and tenant commands. For each of the activity's functional categories, if the sum of all current assets assigned to that category code is greater than the calculated requirement in the BFR, there is a surplus of space; if it is less, there is a deficiency. BFRs should be updated periodically and must be updated when there is a change in loading or a change in mission.

The purpose of this publication is to present the specific criteria and algorithms used to prepare BFRs for different categories of functional uses.

## 1-2 BFR PROCESS

Information about the process of preparing BFRs can be found in the Naval Facilities Engineering Command (NAVFAC) Business Process Management System (BPMS), which provides a systematic method for the management of various business processes and common practices that produce and/or support production of NAVFAC products and services. The BPMS provides best business processes documentation and links to applicable, appropriate and up-to-date policies, guidance, forms and information.

The BPMS process guide for production of BFRs is located on the NAVFAC portal website at the following secure address:

<https://flankspeed.sharepoint-mil.us/sites/NAVFAC-BPMS/SitePages/NAVFAC-BPMS-Overview.aspx>

## 1-3 BFRs FOR USMC INSTALLATIONS

When preparing BFRs for United States Marine Corps (USMC) installations or for any USMC facilities on Navy installations, the facility planner will ensure that requirements are coordinated with the program requirements of *Marine Corps Installation Command (MCICOM) GF-Facilities at Headquarters Marine Corps*.

## 1-4 ORGANIZATION OF FC 2-000-05N

### 1-4.1 CATEGORY CODE NUMBERS

Chapter 2 of this FC 2-000-05N publication is organized by Category Code Numbers (CCNs), the sequence of which generally corresponds to functional areas and activities.

A complete database of the Department of the Navy CCNs, with supporting facility type and economic factor data fields is available on the *Internet Navy Facility Assets Data Store* (iNFADS), which is available through the secure NAVFAC SharePoint web portal.

Department of Defense (DoD) Instruction 4165.03 establishes the framework and guidance for categorizing Facility Analysis Categories (FACs) and the facility Category Code Numbers (CCNs). This framework provides for the orderly categorization of Real Property for the planning of facilities and real property inventory designations.

The system of Category Code Numbers is grouped using the following series:

- 100 Series – Operational and Training Facilities
- 200 Series – Maintenance and Production Facilities
- 300 Series – Research, Development, Acquisition, Test and Evaluation Facilities
- 400 Series – Supply Facilities
- 500 Series – Medical Facilities
- 600 Series – Administrative Facilities
- 700 Series – Housing and Community Facilities
- 800 Series – Utilities and Ground Improvements Facilities
- 900 Series – Real Estate Facilities

### 1-4.2 PAGE NUMBERING AND APPENDICES

The page numbering system in Chapter 2 of this publication corresponds to the first three digits of the category group.

The appendices to this document are:

Appendix A contains a current listing of Dept. of the Navy CCN's, reflecting data recently downloaded from the NAVFAC iNFADS database.

Appendix B is a list of applicable units of measurement and their abbreviations.

Appendix C is the NAVFAC P-80.1: Runway Capacity Handbook - Fixed Wing.

Appendix D is the NAVFAC P-80.2: Naval Mobile Construction Battalion Facilities.

Appendix E is the NAVFAC P-80.3: Airfield Safety Clearances.

Appendix F is the Austere Facilities Planning Criteria.

### **1-4.3 WEB ACCESS OF PUBLICATION AND COMMENTS**

This publication and its appendices can be found at:

<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/fc-2-000-05n>.

The criteria elements included in this publication are dynamic. As such, they are subject to continuous comment, review and update in response to changing requirements. Users of this criteria are encouraged to submit comments and recommendations regarding the content, application and/or format of the publication for consideration and review. Comments are submitted through the Criteria Change Request system on the WBDG website, at the following web address:

<https://cms.wbdg.org/ccrs/new?ufc=2-000-05N>. Include your contact information, as well as sufficient explanation for evaluation of the recommended changes to the criteria.

## **1-5 REQUIREMENTS IN THE REGIONAL CONTEXT**

### **1-5.1 REGIONAL PLANNING**

Navy leadership is departing from the traditional paradigm, which managed shore infrastructure at the level of individual shore activities. Under Regionalization and the Installation Claimant Consolidation programs, the Navy is shifting toward managing and planning facilities in a larger, regional context (for example, a collection of military installations in geographic proximity to one another). This comprehensive regional approach to planning broadens the field of opportunities beyond those available on an individual activity to include the geographic and functional context of the region. Regional planning looks to reduce redundant facilities within a geographic region and seeks alternative means of satisfying requirements for infrastructure, such as leasing, outsourcing and privatization.

Therefore, a planner must take into account geographically proximate military installations and civilian communities when developing BFRs. While proximate installations may have significant operational differences, they may all provide similar support services. It is feasible that Navy personnel assigned to one activity, as well as retirees in the area, may choose to use support facilities at another installation, which

would reduce or even eliminate facility requirements at the first activity. Additionally, many military installations are located near urban communities, which offer a number of resources to military and their dependents. The services provided by some support facilities in civilian communities, especially morale, welfare and recreation assets, are generally similar to on-base facilities. Planners must account for these community facilities in the BFR process by applying Geographic Adjustment Factors (GAFs), which are multipliers that represent the lower limit of on-base facility requirements. GAFs should not be used when planning at OCONUS installations because personnel usually prefer to use installation facilities, instead of facilities in the local community.

## **1-5.2 METHODS FOR CALCULATING REGIONAL REQUIREMENTS**

There are two methods of calculating requirements for regional planning. For more individualized functions like laboratories, an applicable method is to calculate an individual requirement based on each tenant's loading and then sum the results to produce a final requirement. For common-use functions like golf courses and distribution centers, the preferred method is to add up all the loading to produce a single aggregate requirement and then subdivide the result, as appropriate. While a planner must exercise professional judgment in determining the best method to employ, this document offers specific guidance for the regional planning of supply/logistics facilities and community facilities.

**1-5.2.1 REGIONAL PLANNING OF SUPPLY/LOGISTICS FACILITIES.** Specific regional considerations are included in the introduction to the CCN 430 and 440 Series. With the goal of seeking economies of scale for regional planning, the planner should view the sum of all available assets in their aggregate, wherever practical. It is in this aggregate view of assets that a requirements summary in cubic feet should be translated into an optimal configuration in square feet. In other words, the planning exercise should answer the question: "What is the most efficient accommodation of the cubic foot requirement within the existing or planned square footage (facilities and systems)?"

**1-5.2.2 REGIONAL PLANNING OF COMMUNITY FACILITIES.** Various transportation studies were consulted to determine the distance that the average person is willing to walk and to drive to community facilities. These distances are considered the "service radius" of the facility. If a military installation is located in proximity to another military installation or civilian community that offers one of the following community facilities, use of this off-base facility should be taken into consideration. If the off-base facility is within the service radius (as detailed in the following table) from the installation, a similar facility may not be required on the installation. Refer to the introduction for the CCN 740 Series for detailed information about project validation assessments and other topics.

**Table 1-1. Regional Travel Times (CCN 740, 750 and 760 Series)**

Category(s)	Category Description(s)	Service Radius Walking Time (minutes)	Service Radius Driving Time (minutes)
740-01, -04, -23, -86	Exchange Retail Store; Food Service; Commissary; Warehouse	15	15
740-02, -08, -11	Location Exchange; Food Store/Grocery, ServMart	5	5
740-09, -71	Exchange Service Outlets; Package Stores	15	15
740-03, -13, -16, -90	Exchange Central Admin; Laundry Plants; Maintenance Shops; Distribution Centers	0	45
740-23	Commissary	15	15
740-12, 740-25	Red Cross/Navy Relief, Family Services Center	0	30
740-18, 740-19	Bank, Credit Union	10	10
740-26	Installation Restaurant	15	15
740-27	Armed Forces Radio/TV Station	N/A	N/A
740-30	Exchange Gas/Service & Auto Repair Station	0	15
740-32	Exchange Car Wash	0	10
740-34	Thrift Shop	15	15
740-37	Special Services Issue & Office	15	15
740-38	Auto Skills Center	0	15
740-40, 740-46	Bowling Center, Skating Rink	15	30
740-44, 740-45	Fitness Facilities	15	15
740-47	Information, Ticket & Tours	15	15
740-53	Indoor Swimming Pool	15	15
740-54, 740-55, 740-74	Recreation Centers; Youth Centers, Child Development	15	15
740-56, 750-50	Theater; Outdoor Theater	15	15
740-60, -64, -67, -68, -70	Mess / Clubs / Catering Facilities (all ranks)	10	15
740-76	Library	15	15
740-75, 740-79	Navy Flying Club; Riding Stable	0	30
740-77, 740-90	Community Storage, MWR Equipment Maintenance	0	20
740-88	Educational Services Office	15	30
750-10, -20, -22, -30	Outdoor Playing Courts; Fields; Jogging Track; Pool	15	30
740-80, 750-40, 750-56	Golf Clubhouse; Golf Course; Driving Range	0	60
750-21, 750-23	Batting Cage, Go-Cart Track	0	30
740-52, 750-52	Skeet/Trap Building, Skeet/Trap Range	0	30
750-37, 750-38	Outdoor Adventure Area; Equipment Rental Storage	15	20
740-78, 750-54, 750-57	Recreation Pavilion, Band Stand & Recreation Grounds	10	20
740-81, 740-92, 750-58, 750-59	Rental Lodging & Campground (Support, Tents & RVs)	0	60



Category(s)	Category Description(s)	Service Radius Walking Time (minutes)	Service Radius Driving Time (minutes)
740-87, 750-60, 750-61	Marina Support Building, Marina and Recreational Piers	0	60

## 1-6 COMPONENTS OF BFR DEVELOPMENT

BFRs are developed using peacetime mission and loading; they should not include contingencies. BFRs are the product of a regional analysis of the following factors:

1. Projected missions, functions, and tasks,
2. Base loading, and
3. Criteria.

### 1-6.1 PROJECTED MISSION, FUNCTIONS, AND TASKS

Each activity has its own statement of missions, functions, and tasks. Missions are concise, unclassified general statements of what the activity is to accomplish. Functions are workload derived from the main elements of an activity’s mission. Tasks are workload accomplished in connection with existing program policy directives or written tasking assignments. The BFR process assesses an activity’s missions, functions and tasks in the context of base loading and requirements, and translates the output into infrastructure. A first step in translating the activity’s missions into facility requirements is to assign the mission(s) to major functional areas and note the associated facility types, according to the CCN series.

### 1-6.2 BASE LOADING

**1-6.2.1 DETERMINATION OF INCLUSION AREA.** Base loading is the number of aircraft, ships, personnel and equipment assigned to perform the tasks and services. To determine loading for use in a regional BFR, the planner should increase the inclusion area to encompass the larger region while ensuring that personnel or equipment are not double-counted. Typically, there is no predefined geographic inclusion area; an inclusion area may fluctuate depending on the facility being planned or the type of study that the BFRs are supporting. The planner should use sound professional judgment to determine the inclusion area and must have the area validated by the stakeholders prior to completing the BFRs.

**1-6.2.2 USE OF LOADING PROJECTIONS.** BFRs should be prepared using five-year loading projections. Planning beyond the five-year timeframe should be based on approved CNO initiatives. Unapproved, out-year Program Objective Memorandum requests may only be used if no other data is available.

**1-6.2.3 EFFECT OF FLEET RESPONSE PLAN.** The Fleet Response Plan (FRP), which is a new deployment concept, has had important ramifications for ship, aircraft, and personnel loading numbers used in BFRs. FRP combines training and maintenance schedules, manning requirements, equipment and funding to make six carrier strike groups available to the national leadership within 30 days, with two more available within 90 days in times of war or significant crises. During war and times of crisis, deployments will be made to meet the mission and might be less than or more than six months long. Previously, certain loading categories only counted 67% of the deployable populations at a certain installation, under the assumption that 33% of the population would be deployed. Under FRP, BFRs assume 100% of the aircraft loading requirement and 73% of the ship requirement, plus associated personnel.

**1-6.2.4 POTENTIAL LOADING DATA SOURCES.** Commander Navy Installations Command (CNIC) and NAVFAC headquarters are developing a loading database that will be the definitive site for use in Navy BFRs. Until this site is developed, the potential sources listed below are meant to be starting points for data, acknowledging that websites and specific departments may become obsolete. It is the planner's responsibility to 1) gather data from accurate sources and 2) have the loading numbers validated by the stakeholders or client before completing the BFRs.

**Table 1-2. Potential Aircraft Loading Sources**

Categories	Potential Sources
<p>Permanent duty stations of aviation units include the number and type of squadrons including the wing, and the number and type of aircraft assigned to the wing and squadrons.</p>	<p>Information about wings and squadrons assigned to each region is available from the TYCOM.</p>
<p>Transient Aircraft are supported at activities for military transport aircraft or transiting aircraft that are enroute to deployment areas. Installations assigned transient aircraft must include facility requirements for average daily on-board aircraft. Transient aircraft also include visiting aircraft at installations located within close proximity of training ranges (e.g., firing or Fleet Carrier Landing Practice airfields). Peak loadings for exercises or contingencies are not to be used for</p>	<p>Projections of aircraft for each wing/squadron are available in the Primary Assigned Aircraft allowance, which can be provided by the Operations Officers of the wing/squadron.</p> <p>Aircraft procurement data is available from Commander, Naval Air Forces (CNAF).</p> <p>Transient aircraft data must be accounted from the average daily loading of Air</p>

Categories	Potential Sources
determination of allowances. Transient aircraft maintenance is generally supported at home ports and home bases.	Operations records.

**Table 1-3. Potential Ship Loading Sources**

Categories	Potential Sources
<p>Current and projected homeport assignment of ships. This data requires the collection of ship type and numbers of ships within each ship type.</p>	<p>Naval Vessel Register  <a href="http://www.nvr.navy.mil">http://www.nvr.navy.mil</a></p>
<p>Operational Tempo considers the number of ships in port versus the number of ships at sea (i.e., deployed/rotational units are to be counted at the receiving installation). Under the Fleet Response Plan (FRP), assume that 73% of surface and subsurface ships including personnel are at homeport at any given time. Assume that 27% of surface and subsurface ships including personnel are deployed.</p> <p>Pier-side maintenance scheduling encompasses dredging, fender repairs, mooring repairs, etc. This limits the amount of berthing space for ships.</p> <p>Transient/Other Ships include Military Sealift Command, MARAD, visiting ships, foreign ships, ship commissioning and decommissioning. Average on-board numerical data is required for determining requirements. Peak loadings for exercises or contingencies not to be used.</p>	<p>Fleet Commanders (e.g., LANTFLT, PACFLT) and TYCOMS (e.g., COMNAVSURFLANT, COMNAVSURPAC)</p> <p>Port Operations Officers at individual installations</p>

**Table 1-4. Potential Personnel Loading Sources**

The majority of space allowances are based on military strength.

Categories	Potential Sources
<p>Military Strength – all officer (O1-O10) and enlisted personnel (E1-E9) assigned to an activity for permanent duty. Military strength may also include “Permanent Change of Station” (PCS) students, who are assigned to a school on orders lasting more than 20 weeks and may be counted as permanent party personnel, especially for bachelor housing requirements. Reservists are considered the military strength population at Reserve Training Centers.</p>	<p>CNI Housing Intranet (MyHSG) site:  <a href="https://www.emh.housing.navy.mil">https://www.emh.housing.navy.mil</a>                      Maintained by Navy Housing Technical Support at 800-877-8503 or 703-273-5480 or <a href="mailto:eMH@aemcorp.com">eMH@aemcorp.com</a>.</p> <p>Downloads from the Total Force Manpower Management System (TFMMS), managed by the Navy Personnel Command and found at <a href="http://www.npc.navy.mil">http://www.npc.navy.mil</a>.</p>
<p><b>Some CCN series, especially the 500 and 700 series modify the Military Strength calculation and allow the following Transients categories to be included. This will be specifically called out in the CCN series:</b></p>	
<p>Transients – average daily number of personnel on Temporary Duty (TDY), awaiting transfer for further assignment, or pending separation who are not permanently assigned to the activity. Transients may only be counted when sizing facilities that transients specifically use. Discharged medical personnel awaiting PCS assignment are not included.</p> <p>Transients also include groups (1) through (4) listed below:</p>	
<p>(1) Temporary Duty (TDY) Students – personnel assigned to a school on orders for less than twenty weeks. However, only the average number on board may be used and only for sizing facilities that students specifically use.</p>	<p>Chief of Naval Education and Training. BUMED (for TDY medical students).</p>

Categories	Potential Sources
<p>(2) Reservists – personnel assigned to reserve units. Reservists may be counted with the active duty military populations at active duty installations only for sizing facilities that are specifically affected by this group, such as the 740 and 750 series. Eighty percent of the average onboard count of Reservists on weekend or two-week duty may be counted when located at Commander, Naval Air Reserve commanded air stations; twenty percent</p>	<p>Average daily numbers are available from all Naval shore activities.</p>
<p>(3) Rotational personnel – are the average daily number of personnel deployed with squadrons or mobile units on a scheduled basis at locations other than their homeport. Deployed personnel are counted at the activity to which they are deployed.</p>	
<p>(4) Personnel assigned to ships undergoing overhaul.</p>	<p>Overhaul schedules for the next six years can be obtained from the Naval Sea Systems Command.</p>
<p><b>The following non-transient populations may be included in some BFR calculations, but must be specifically indicated as such in the CCN explanatory material. These potential populations include:</b></p>	
<p>Civilians – DoD Civilians and foreign nationals (at OCONUS installations) are counted in category codes where they are</p>	<p>Data about civilians is available from all Naval shore activities (typically the Human Resources Office).</p>
<p>Contractors – private-sector contractors employed by the DoD or employees of other services, agencies or nations working with the DoD.</p>	<p>The contract document or the Memorandum of Understanding usually details the amount and kinds of space required to accommodate these personnel.</p>

Categories	Potential Sources
<p>Retiree Population – number of retirees living within a thirty-minute drive of the installation. Retired personnel may be counted in facility requirements only if indicated in the respective allowance table and to the percentage authorized. Dependents of retired personnel are not counted.</p>	<p>If the installation cannot provide data, use most current FY Statistical Report provided by the DoD Office of the Actuary, <a href="http://actuary.defense.gov">http://actuary.defense.gov</a>. In areas with many military installations, consult with the activities to determine the appropriate number of retirees apportioned to each installation.</p>
<p>Dependents – spouses and children of assigned military personnel. Dependents are counted in requirements if the individual CCN's allowance table indicates that they may be counted and only to the percentage authorized. While a reduction in military strength should be made to account for military personnel on deployment, no similar reduction should be made in calculating dependent population, as dependents remain at the homeport location. In BFRs that require calculating “installation population,” dependents of military strength assigned to the installation are included.</p>	<p>through Defense Manpower Data Center (DMDC) Data Request System at <a href="https://www.dmdc.osd.mil/drs">https://www.dmdc.osd.mil/drs</a>.</p> <p>* Data as of 18 February 2005 is included below in Table 1-5.</p>

**Table 1-5. Dependent Data**

GRADE	% Distr	% Single	% w/ Depdts	% Married	Avg. # of Children
E-1	3.80%	90.67%	9.33%	8.20%	1.2
E-2	5.79%	83.47%	16.53%	14.67%	1.2
E-3	18.93%	67.42%	32.58%	29.57%	1.4
E-4	19.19%	53.14%	46.86%	41.93%	1.5
E-5	23.82%	33.90%	66.10%	58.26%	1.8
E-6	17.66%	14.10%	85.90%	77.53%	2.1
E-7	7.63%	6.88%	93.12%	85.88%	2.3
E-8	2.19%	4.88%	95.12%	88.51%	2.2
E-9	0.99%	4.58%	95.42%	90.31%	2.1
<b>Enlisted Total</b>					<b>1.9</b>
O-1	11.70%	63.70%	36.30%	32.77%	1.9
O-2	13.05%	47.14%	52.86%	48.07%	2
O-3	32.80%	28.37%	71.63%	67.18%	2
O-4	19.47%	12.78%	87.22%	83.33%	2.2
O-5	13.06%	8.39%	91.61%	88.03%	2.3

GRADE	% Distr	% Single	% w/ Depdts	% Married	Avg. # of Children
O-6	6.47%	7.45%	92.55%	89.33%	2.2
O-7	0.20%	3.70%	96.30%	92.59%	1.8
O-8	0.13%	5.88%	94.12%	92.65%	1.5
O-9	0.06%	3.23%	96.77%	93.55%	1.5
O-10	0.02%	0.00%	100.00%	100.00%	0
<b>O-1 to O-10 Total</b>					<b>2.1</b>
W-1	1.30%	6.51%	93.49%	74.82%	2.3
W-2	1.15%	5.72%	94.28%	80.72%	2.2
W-3	0.55%	6.19%	93.81%	88.32%	1.9
W-4	0.05%	0.00%	100.00%	100.00%	1.7

**Table 1-6. Potential Equipment Assigned Loading Sources**

Categories	Potential Sources
Materials requiring storage – quantity (usually expressed in volume) of an item that must be stored.	Host or Tenant Command maintains a “Table of Allowances”
Ordnance requiring storage – type and amount of munitions (by volume, Net Explosive Weight Compatibility Group).	Installation ordnance load plans are available from Naval Operational Logistics Support Center (NOLSC), Mechanicsburg, PA. See CCN 421 series for details. Also check with Fleet Commanders Ordnance staff for fleet ordnance download requirements from ships.

**1-6.2.5 NEED FOR DOCUMENTATION.** BFRs must thoroughly document loading numbers by including citations of the sources used and explanations of the methodology employed. Loading numbers should be cited on each individual BFR justification worksheet and in a summary loading worksheet included at the beginning of a BFR package.

**1-6.3 CRITERIA**

**1-6.3.1 CRITERIA COMPONENTS.** The methodology set forth in this publication allows facilities to be appropriately sized and provides uniformity. Specifically, the criteria ensure that the existing and planned facilities are neither too small nor too large to accomplish standard mission objectives. The criteria also establish common planning standards within the Navy. Criteria information in this publication can be separated into several components, as follows:

Description of the facility – The description usually includes: the primary function of the facility; the relationship with operational components; installation types that require this facility; list and relationships of internal functional elements; and references to other publications that provide more detailed data.

Specific planning factors – This is quantitative facility data, which are usually presented in tables as formulas or in fixed gross allowances. Fixed allowances are used when a specific facility type is uniform throughout the Navy. It is important to note that fixed gross allowances do not include such facility components as loading docks and porches. If a planner expects that a facility may have these components, then the planner must adjust the BFR to accommodate them.

Approximate planning factors – For some facilities, development of specific planning factors is not feasible. However, the size of these facilities will usually fall within a limited range that has been identified by engineering surveys. Detailed justification of these requirements may be required.

**1-6.3.2 GUIDELINES IN APPLYING CRITERIA.** The criteria should be considered guidelines, not regimented formulas. In certain circumstances, a planner may need to modify criteria or even develop new requirements. Some CCNs do not require BFRs, such as the 800 and 900 CCN series, Family Housing, and other individual CCNs per NAVFAC P-72. Likewise, no activity is automatically entitled to a facility size allowance or the facility itself, just because the facility is included in this document. Every facility must be justified on the basis of need. Requirements should neither be based on the size of existing assets simply to justify their retention nor inflated to accommodate existing inefficient or oversized assets.

In fact, a smaller facility than the maximum gross allowance may be adequate to meet an activity's needs. Although a BFR is initially based on facilities sizing guidelines and established planning criteria, the resulting maximum allowances should be reviewed within the context of existing conditions. If the existing space is sufficient and this amount is less than the derived allowance, then the BFR should be reduced. Likewise, when a facility is sized based on regional loading, it may be smaller than the aggregate of similar facilities whose separate sizes are based on individual activity population. This difference is acceptable because the sizing reflects economies of scale. However, it is incumbent upon the planner to be consistent in the methodology used for both BFR development and actual facility sizing and construction.

**1-6.3.3 NET-TO-GROSS FACTORS.** In addition to the specific criteria presented under each category code, the net-to-gross factors should also be considered in developing the final space allowance. In some countries, net-to-gross factors for facilities are larger than what this document indicates. This is due to Host Nation laws and norms that require additional space, such as larger and more numerous corridors,



stairwells, mechanical rooms on exterior walls, safe rooms accessible via stairwells at each floor, separate mechanical and electrical rooms and wider egress doors. Many countries also have day lighting requirements that may justify the use of atriums or open courtyards and, therefore, restrict the building shape.

Planners must document and apply appropriate net-to-gross factors. This will ensure projects have sufficient building area and cost built into the program in order to prevent functional areas from being reduced during project design. Each project must be considered independently. Higher factors may be justified for increased circulation requirements in multi-story buildings or in buildings with several different functional spaces. Consideration also should be given to the type of facility (for example, warehouse requirements may require higher allowances, as per Table 440A & B), variation of occupant functions, local requirements and site limitations on building size and shape. Also, the number of occupants may dictate allowances; for example, uninhabited facilities like Military Working Dog kennels and armories may not necessitate higher allowances. If a planner decides to adjust the net-to-gross factors based on any of the above situations, appropriate justification must be included in the BFR documentation.

*NOTE: All criteria or algorithms listed in this publication produce gross area, unless otherwise noted.*

## **1-7 ADDITIONAL PLANNING GUIDANCE**

Commander, Navy Installations has chartered an integrated product team (IPT) to review the two primary BFR types: a Planning BFR, which typically is an “80% solution” used when preparing large quantities of BFRs as part of Regional Overview, Functional, or Activity Plans; and the Project BFR, which is a 100% scope solution used to justify a MCON or Special Project. Once the results are evaluated in the Fall of 2005, the BFR IPT team will release more definitive guidance about the appropriate use of each type. Traditionally, the Navy Audit Service has used this FC 2-000-05N publication as the source document when auditing MCON projects. This publication’s criteria are also enforced to ensure that operational safety and security criteria are followed. Under the regional planning model, however, variations may be necessary and the following topics should be considered when calculating BFRs:

### **1-7.1 ADJUST FOR OPERATIONAL CONDITIONS**

Many operational conditions, circumstances and influences can affect the use of Navy facilities. For example, the use of specific equipment or the conduct of certain

operations may require that a facility be larger or smaller than anticipated. In addition, some rooms in the facilities may be unable to be occupied while such equipment is being used or operations are underway. These conditions must be taken into account when determining the requirements for a specific facility.

It is also difficult to develop specific planning factors for unique, one-of-a-kind facilities, such as Research, Development, Testing, and Evaluation facilities. Requirements for these facilities should be based on an engineering analysis of the operation and the specific uses within the facility. Planners may also look to examples in other services, government agencies and in the private sector, keeping in mind that specialized Navy security requirements may alter these facility requirements. Regardless of the example used or method employed, the planner is responsible for providing a detailed justification of the resulting requirement.

## **1-7.2 UNDERSTAND HOST / TENANT RELATIONSHIPS**

The planner must determine if a host activity is responsible for providing common facilities to both personnel assigned to the host and the personnel attached to tenants that are supported by the host activity. The planner must recognize these support relationships and develop base loading figures accordingly. While CNIC is in the process of establishing the formal relationships, interim host/tenant relationship information is available in the Activity Module of INFADS.

## **1-7.3 USE SOUND PROFESSIONAL JUDGMENT**

The planner must be prepared to provide appropriate justification for any deviations from established criteria. Appropriate justification may include the number and organizational status of the personnel, support space requirements, space needed for each function within the facility, and an industrial engineering analysis of the operations. There are two techniques for preparing industrial engineering analyses: one technique is to indicate each piece of equipment and operational feature with their corresponding working and/or access space requirements in a scaled drawing; the other technique is to list the above components and their sizes in columnar format. The totals obtained from either method, plus an appropriate net-to-gross conversion factor, yield the requirement.

Complete BFR justifications should be in tabular format and should include the date of their preparation and citations of sources that were used. Do not consider “based on experience” to be sufficient justification for a BFR without further clarification or analysis. The example worksheet on the following page provides more information.

## 1-7.4 REFERENCE DOCUMENTS

This publication, FC 2-000-05N, should serve as the Navy Facility Planners' primary resource for determining facility space requirements. The following documents and resources are among the many sources of supplementary information that can provide supporting data and guidance to assist with establishing and justifying the necessary facility space requirements:

- 1) DOD Tri-Service Unified Facility Criteria (UFC) and DON Facility Criteria (FC) manuals, which provide technical discipline and facility specific guidance and criteria, and are located on the Whole Building Design Guide (WBDG) website: <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc>. Examples are:
  - UFC 1-200-02 *High Performance Buildings*
  - UFC 3-101-01 *Architecture*
  - FC 4-721-10N *Navy and Marine Corps Unaccompanied Housing*
- 2) DOD Unified Facilities Space Program Spreadsheets, located on the WBDG website: <https://www.wbdg.org/ffc/dod/unified-facilities-space-program-sustainability-spreadsheets>, which provide space allowance calculations (for a limited number of facility types) based on the criteria presented in this UFC and in the manuals noted in item 1 above.
- 3) NAVFAC P-970 Planning in the Noise Environment located on the NAVFAC informational documents web-portal page: <https://portal.navy.mil/portal/page/portal/084BACA3D5146AC9E0440003BA8FC471>
- 4) NAVSEA OP5, Vol.1 Ammunition and Explosive Ashore: Explosive Storage and Safety Distance
- 5) DD Form 805 Storage Space Management Report

Planners should also solicit input from functional area experts and local Activity representatives. Incorporating information from these and other sources will help ensure that there is a correlation between the program needs and the types and sizes of spaces to be provided.

## 1-7.5 EXAMPLE OF WORKSHEET

The following worksheet is included as an example of how to present the BFR justification calculations. While the exact formats are not mandatory, all worksheets should be dated and include the name of the person who prepared the information.

Figure 1-1. Example Basic Facilities Requirements Justification Worksheet

BASIC FACILITY REQUIREMENTS WORKSHEET			
Activity -	NAB Little Creek		UIC - N61414
CCN -	740-76	DESCRIPTION -	MWR Library
HOST UIC -	N61414		Criteria Used:
Special Area -			X P-80 Criteria
			X Engineering Evaluation
			Other
LOADING ANALYSIS / JUSTIFICATION OF REQUIREMENT			
<p><b>A. MISSION:</b> The Naval Amphibious Base Little Creek Library is required to provide active duty personnel and their family members professional and educational enrichment materials to enhance the Navy quality of life and to provide leisure and recreational materials for their personal enjoyment.</p>			
<p><b>B. PLANNING CRITERIA:</b> Basic Facilities Requirements (BFR) for Category Code 740-76, MWR Library, was developed in accordance with NAVFAC P-80, Facility Planning Criteria for Navy and Marine Corps Shore Installation.</p>			
<p><b>C. LOADING:</b> Based on a FY02 Base Loading report: Officers (953); Enlisted (7,244); Military Strength total is 8,197.</p>			
<p><b>D. ANALYSIS:</b></p>			
1. Table 740-76A	1,670 m <sup>2</sup> or 18,000 GSF		
2. Staff	2PN x 130 NSF = 260 NSF		
Limited Duty	4 PN x 90 NSF = <u>360 NSF</u>		
	620 NSF		
	620 NSF x 1.25 GSF/NSF = 775 GSF		
Total:	18,000 + 775 = <b>18,775 GSF or 1,742 m<sup>2</sup></b>		
<b>REQUIREMENT: 18,775 GSF or 1,742 m<sup>2</sup></b>			<b>Page 1 of 1</b>
<p>Date Prepared: January 18, 2002                  Prepared by: Jane Doe, Code HBJD, NAVFAC</p>			

**CHAPTER 2 - FACILITY PLANNING CRITERIA FOR SERIES 100 THROUGH 900**

- 100 Series – Operational and Training Facilities
- 200 Series – Maintenance and Production Facilities
- 300 Series – Research, Development, Acquisition, Test and Evaluation Facilities
- 400 Series – Supply Facilities
- 500 Series – Medical Facilities
- 600 Series – Administrative Facilities
- 700 Series – Housing and Community Facilities
- 800 Series – Utilities and Ground Improvements Facilities
- 900 Series – Real Estate Facilities

**FACILITIES CRITERIA (FC)**  
**FACILITY PLANNING FOR NAVY AND**  
**MARINE CORPS SHORE INSTALLATIONS**

**Series 100: OPERATIONAL AND TRAINING FACILITIES**

**Record of Changes:**

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of Change</b>
08 May 2018	131	Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, And Reconnaissance (C5ISR) Buildings	Updated criteria to meet current mission requirements for Communications, Information, and Intelligence Facilities.
08 May 2018	131 15	Communications, Information, Or Intelligence Facility	Updated criteria to meet current mission requirements for Communications, Information, and Intelligence Facilities.
08 May 2018	131 17	Communications Station	CCN Deleted. Rolled into 131 15.
08 May 2018	131 24	Satellite Communications Facility	Updated criteria to reflect new 131 Introductory criteria.
08 May 2018	131 35	Receiver Building	Updated criteria to reflect new 131 Introductory criteria and eliminate references to CCNs that are being deleted.
08 May 2018	131 40	Telecommunications Distribution Facility	Updated criteria to reflect new 131 Introductory criteria.
08 May 2018	131 42	Automatic Communications Switching Center	Updated criteria reference for 131 40 to the new title name..
08 May 2018	131 50	Transmitter Building	Updated criteria to reflect new 131 Introductory criteria.
08 May 2018	131 60	Military Affiliate Radio Station (Mars	Updated criteria to indicate use for "inventory purposes only" until the CCN is absorbed or eliminated.
08 May 2018	131 65	Communications Analysis Facility	CCN Deleted. Rolled into 131 15.
08 May 2018	137 10	Meteorology And Oceanography Building	CCN Deleted. Rolled into 131 15.
08 May 2018	143 40	Computer Programming Operations Center	CCN Deleted. Rolled into 131 15.
08 May 2018	143 65	Region / Installation Emergency Operations Center	Updated criteria to reflect new 131 Introductory criteria.

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of Change</b>
08 May 2018	143 80	Mission Operation Command And Control Facility	Updated criteria to reflect new 131 Introductory criteria.
08 May 2018	C5ISR	Command, Control, Communications, Computers, Combat Systems, Intelligence, Surveillance, And Reconnaissance (C5ISR) Facilities	A C5ISR BFR Calculator is available on the NAVFAC Portal to be used in tandem with the updated C5ISR Planning Criteria. Use the portal search function to search for "C5ISR BFR Calculator".
13 June 2018	125 20	Shed/Shelter For Pump Station And Ancillary Equipment	Remapped to FAC 1459 as per OSD/RPCP FY18.
13 June 2018	143 09	Expeditionary Ops Support Facility	Changed title from "Expeditionary Ops Support Module" to "Expeditionary Ops Support Facility" as per OSD/RPCP FY18.
13 June 2018	171 21	Decontamination Training Facility	CCN deleted. Not a standalone facility.
24 Oct 2018	143 80	Mission Operation Command And Control Facility	Minor change to language in section 14380-2.
11 June 2019	171 30	Physical Education Building	Minor editorial change to paragraph numbering
12 July 2019	143 12	Operational Storage Laydown	Updated table 14312-1 and 14312-2 and added verbiage
08 Aug 2019	116 55	Tactical Support Laydown Area	Changed Title from "Ordnance Handling Pad" to "Tactical Support Laydown Area"
08 Aug 2019	121 20	Aircraft Truck Fueling Facility	Remapped to FAC 1261.
08 Aug 2019	122 30	Small Craft Ready Fuel Storage	Remapped to FAC 1242.
08 Aug 2019	179 09	Ship Loading and Unloading Mockup	Remapped to FAC 1732. Changed UM to SF
08 Aug 2019	179 11	Air Transport Mockup	Remapped to FAC 8526. Changed UM to SY
08 Aug 2019	179 12	Elevated Training Tower/Platform	Changed Title from "Parachute Landing Fall Platform" to "Elevated Training Tower/Platform". Remapped to FAC 1734.
08 Aug 2019	179 13	Suspended Harness Mockup	CCN Deleted in FY19. Assets have been consolidated into CCN 179 12
08 Aug 2019	179 14	Mockup Jump Tower	CCN Deleted in FY19. Assets have been consolidated into CCN 179 12

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of Change</b>
08 Aug 2019	179 15	Underwater Fording Site	CCN Deleted in FY19.
08 Aug 2019	179 18	Airfield Demolition Range (ADR)	Changed Title from "Road/Airfield Construction Training Site" to "Airfield Demolition Range"
24 Sep 2019	111 30	Runway Overrun-Paved Surface	Revised Table 11130-1 for longitudinal centerline grade, Class A Runway to match recent update of UFC 3-260-01.
24 Sep 2019	141 82	Full Pressure Suit Facility	Revised text to indicate pressure suit maintenance is normally performed in the Aviation Life Support Systems Shop (Non-Navair Depot), Category Code 211 75.
03 August 2020	116 41	Improved Fresnel Lens Optical Landing System (IFLOLS) Pad	CCN added.
03 August 2020	143 08	Expeditionary Ops Boat Maintenance Repair Facility	CCN added.
03 August 2020	143 13	Operational Vehicle/Equipment Canopy	CCN added.
03 August 2020	144 40	Scale House	CCN added.
03 August 2020	148 10	Ship Propulsion Support Facility	Retitled and changed description to remove the term "nuclear".
03 August 2020	148 15	Ship Weapons Handling Facility	Retitled and changed description to remove the term "nuclear".
03 August 2020	148 20	Ordnance Demolition Area	CCN deleted but see note under 148 20.
03 August 2020	148 25	Explosive Truck Holding Yard	Remapped to FAC 8526. UM changed to SY.
03 August 2020	148 35	Container Holding Yard	Remapped to FAC 8526. UM changed to SY.
03 August 2020	148 40	Container Transfer Facility (Ordnance)	Remapped to FAC 8526. UM changed to SY.
03 August 2020	148 45	Rail/Truck Receiving Station (Ordnance)	Remapped to FAC 8526. UM changed to SY.



Date	CCN #	CCN Title	Description of Change
03 August 2020	149 20	Aircraft Catapult	CCN deleted but see note under 149 20.
03 August 2020	149 62	Tactical Vehicle Wash Facility	CCN added.
03 August 2020	153 10	Cargo Staging Area	Remapped to FAC 8526.
03 August 2020	179 21	Armored Vehicle Launch Bridge, Raft, and Ford Area	CCN deleted.
03 August 2020	179 53	Enclosed Fire Fighter Trainer Facility	CCN added.
01 April 2021	151 Section 151-1	Pier Facilities	Delete reference to 165-10. Add reference to UFC 4-150-06, Military Harbors and Coastal Facilities
01 April 2021	151 Section 151-4	Pier Facilities	Add complete title, Military Harbor and Coastal Facilities for UFC 4-150-06.
20 Jan 2023	143-11	Operational Vehicle Garage	1. Expand the "Definition" information. 2. Include additional guidance for calculating the space requirements. 3. Add new tables with space requirements.
20 Jan 2023	143-12	Operational Vehicle Parking/Laydown Area	Change Net to Gross factors for Table 14312-1 and added 1B designation to Table 14312-2.
20 Jan 2023	143-22	Navy Explosive Ordnance Disposal Shore Detachment Facility	Redefine EOD Shore DET Facility.
20 Jan 2023	149-10	Protective Barricades	Redefine Protective Barricade/Revetment to support explosives safety requirements.
20 Jan 2023	148-20	Ordnance Demolition Area	CCN was deleted in Aug 2020 but is reinstated and will be remapped to FAC Code 1783 in FY23.
20 Jan 2023	173-40	Observation Tower/Bunker	CCN added to serve as a protective shelter facility at ranges for personnel protection.
2 Mar 2023	100 Series	UFC 2-000-05N	Change UFC 2-000-05N to FC 2-000-05N document due to the fact that this planning criteria is not unified among the other DoD services.
17 Mar 2023	141-20	Aircraft Fire and Rescue Station	Change URL to access Space Planning Spreadsheet. Change URL to access Design UFC 4-730-10 Fire Stations.
17 Mar 2023	151 Series, 151-5	Pier Facilities	Change URL to access Design UFC 4-150-06 Military Harbors and Coastal Facilities.

Date	CCN #	CCN Title	Description of Change
17 Mar 2023	171-15, Section 17115-3.2	Navy and Marine Corps Reserve Training	Change URL to access NOSC Space Planning Spreadsheet. Change URL to access Design Criteria FC 4-171-06N Navy Operational Support Center.
31 Mar 2023	123-30, Section 12330-7	Vehicle and Equipment Ready Fuel Storage	Replace reference CCN 126-50 with CCN 126-15 Petroleum Ready Fuel Storage Facility.
31 Mar 2023	156-10, Section 15610-1	Waterfront Transit Shed	Include reference to Section 440-2 General Supply Requirements in Category Code 440 Series.
11 Jul 2023	126-15	Petroleum Ready Fuel Storage Facility	Change the Unit of Measure (UM) from BL to GA.
30 Aug 2023	131-12 131-13 131-17 135-11 135-12 135-13 135-15 135-21 135-31 135-32 135-33	Communications Maintenance Vault Communications Maintenance Tunnel Communications Maintenance Channel Fiber Optic Communications Lines, Underground in Conduit Fiber Optic Communications Lines, Non-Conductive Riser Rated Fiber Optic Communications Lines, Outside Plant, Armored Optical Ground Wire Fiber Optic Communications Lines, Outside Plant, Marinized (Underwater/Wetland) Copper Communications Lines, Outside Plant, Gel Filled Copper Communications Lines, Outside Plant, Air Core Copper Communications Lines, Outside Plant, Marinized (Underwater/Wetland)	Category Code changes included with updated descriptions / definitions for all CCNs listed.

Date	CCN #	CCN Title	Description of Change
	135-34	Copper Communications Lines, Outside Plant, Armored	
	179-17	Rappelling Training Area	
	179-24	Water Supply Training Area	
	143-10	Emergency Vehicle Garage	
30 Aug 2023	111-12	Runway / Fixed Wing – Unsurfaced	New Category Code information clarified
	179-51	Unenclosed Fire Fighter Trainer	For CCNs 179-51, 179-54, and 179-54, new information included to clarify the distinction between the various types of trainers.
	179-53	Enclosed Fire Fighter Facility	
	179-54	Damage Control (Wet) Trainer	
14 Dec 2023	143 75	POL Operations/Sampling/Testing Building	Change 162.5 NSF to 162-5 GSF. Change sentence that illustrates “net area” to “gross area.” In sentence that illustrates “gross to net multiplier,” change to “net-to-gross multiplier.”
4 Apr 2024	143 26	Marine Corps Explosive Ordnance Disposal Company Facility	Develop update planning criteria to support changes to Marine Corps EOD operations.
4 Apr 2024	171 50	Small Arms Range - Indoors	Change design UFC reference in Section 17150-3 to UFC 4-179-02.
4 Apr 2024	122 20	Small Craft Fueling Station	In Section 12220-3, delete reference to CCN Series 124 and replace with “See Category Code 122 30 for additional fuel storage information.”

## 100 SERIES OPERATIONAL AND TRAINING FACILITIES

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## **110 AIRFIELD PAVEMENTS**

### **110-1 PAVEMENTS**

This category group includes all pavements necessary for use by operational aircraft. Planning for pavements shall include all safety clearances and facilities required to provide a fully operational field, complete with accessories such as aircraft tie-downs and pavement marking. Airfield pavement lighting is considered separately under 133/134 series category codes. See NAVFAC p-80.3, airfield safety clearances, for criteria on obstruction clearances and clear zones related to airfields and heliports. Clearances and separations related to a specific pavement type (for example: the separation between parallel runways) is given under the applicable category code within the 110 code series.

Facilities considered in this category group are:

- 111 Airfield Pavements - Runways (includes helipads)
- 112 Airfield Pavements - Taxiways
- 113 Airfield Pavements - Aprons
- 116 Airfield Pavements - Other

### **110-2 CLASS A AND B RUNWAY CRITERIA**



The airfield criteria published herein differs from previous criteria in that it has been revised to conform to the standards published in the Unified Facilities Criteria (UFC), 3-260-01, Airfield and Heliport Planning and Design and the Air Installations Compatible Land Use Zone (AICUZ) program defined in OPNAVINST 11010.36B. The unified facilities criteria are defined in terms of class A and B runways and their supporting taxiways, aprons, etc. The A and B runways and the application of an A or B designation to a particular runway is explained in NAVFAC P-80.3 and summarized in Table 110-A. All Navy and USMC supporting pavements such as taxiways, aprons, etc., shall be considered class B unless their use is totally dedicated to supporting a runway which has been designated class A and the application of class A standard has been approved by Headquarters NAVFACENGCOM and NAVAIRSYSCOM.

**Table 110-1. Class A and Class B Runway Characteristics**

Characteristic Description	Class A Runway	Class B Runway
Length	Based on Aircraft Ground Run, adjusted for temperature and altitude correction times the factor of safety	
Width	75 feet (22.9 meters)	200 feet (61 meters)
Width of Shoulders	25 feet (7.6 meters)	150 feet (45.7 meters)
Longitudinal grades of Runway and Shoulders	Maximum 1.0%	Maximum 1.0%
Longitudinal Runway grade changes	Maximum 0.167% per 100 lineal feet (30.5 lineal meters) of Runway	Maximum 0.167% per 100 lineal feet (30.5 lineal meters) of Runway
Transverse grade of Runway	Minimum 1.0% to a Maximum 1.5%	Minimum 1.0% to a Maximum 1.5%
Transverse grade of Shoulder	5.0% for first 10 feet (3.05 meters) then Minimum 2.0% to a Maximum 3.0%	Minimum 2.0% to a Maximum 3.0%
Runway lateral clearance distance (Primary Surface)	500 feet (152 meters) from centerline of Runway	1,000 feet (305 meters) from centerline of Runway. For Taxiways: 500 feet (152 meters) from centerline of Taxiway to centerline of Runway.
Longitudinal grades within the Primary Surface	Maximum 10.0% exclusive of Pavements, Shoulders, and cover over Drainage Structures.	Maximum 10.0% exclusive of Pavements, Shoulders, and cover over Drainage Structures.
Transverse grades within Primary Surface (in direction of surface drainage)	Minimum 2.0% prior to channelization, Maximum 10.0%.	Minimum 2.0% prior to channelization, Maximum 10.0%.
Distance between centerlines of Parallel Runways: i.) VFR ii) VFR with intervening parallel taxiway iii) IFR using simultaneous approaches	Not Applicable Not Applicable Not Applicable	1,000 feet (305 meters) 2,075 feet (632 meters) 4,300 feet (1,320 meters)
Sight distance (any two points 8 feet (2.44 meters) above the pavement must be mutually visible).	Minimum 3,000 feet (914 meters) (2 points above 5 feet (1.52 meters) above pavement visible).	Minimum 5,000 feet (1,520 meters)

**RUNWAY CLASSIFICATION.** The classification is dependent on the type of aircraft, which operate from the runway. Table 110-2 provides the runway classifications for all Navy and Marine Corps aircraft as well as aircraft from other services or government agencies. These aircraft are listed by aircraft type. Each type includes all model variants.

Transient aircraft from other services or government agencies are special exceptions in the planning of Navy and Marine Corps air stations. Individual justification must be made for these cases where runway length must be extended to allow for the landing and takeoff of these aircraft.

**Table 110-2. Runway Classifications by Aircraft Type**  
(Aircraft are listed by type, each type includes all models)

Class A Runways		
C-1	C-26	UV-18
C-2	E-1	V-22 (1)
C-12	E-2	T-44
C-20	OV-1	U-21
C-21	T-6	
C-23	T-34	
Class B Runways		
A-6	DASH-7	SR-71
A-10	DASH-8	T-1
AV-8	E-3	T-2
B-1	E-4	T-37
B-2	E-6	T-38
B-52	F-5	T-39
C-5	F-14	T-42
C-9	F-15	T-45
C-17	F-16	TR-1
C-40A	C-10	F-22
U-2	F/A-18	F-117
C-130	P-3	
C-141	S-3	

Note: V-22 aircraft is a rotary wing aircraft which operates as a rotary wing aircraft on a Class A runway and operates as either a fixed wing or rotary wing aircraft on taxiways associated with Class A runways.

Class A runways are primarily used by small light aircraft as indicated in Table 110-2 and the runway should not have the potential for development for use by heavier aircraft or have a foreseeable requirement for such use. Ordinarily, Class A runways are less than 8,000 feet (2,440 meters) long and less than 10 percent of the operations involve

class B type aircraft. Class B runways are primarily intended for high performance and large heavy aircraft as indicated in Table 110-A. Basic training outlying fields used by T-34 aircraft have specified special criteria.

The classification of Navy and Marine Corps runways is determined as a part of the Air Installations Compatible Land Use Zone (AICUZ) program and is published in AICUZ study for a particular installation. NAVFACENGCOM and NAVAIRSYSCOM concurrence and CMC/CNO approval is required prior to classifying any runway Class A or B. This approval is obtained via approval of the AICUZ study.

## 111 AIRFIELD PAVEMENTS - RUNWAYS

Series 111 Category Codes include criteria for runways for fixed wing aircraft and runways or landing pads for rotary wing aircraft. Runways are prepared surfaces for the landing and takeoff of both fixed wing and rotary wing aircraft. Landing pads are prepared surfaces for the Vertical Takeoff and Landing (VTOL) of rotary wing aircraft (including V-22). The number of runways and/or landing pads is determined by the expected traffic density, airfield mission, operational procedures, and environmental factors. Runway orientation is determined from analysis of wind data, terrain, noise levels generated, and local development conditions.

### 111 10 RUNWAY/FIXED WING (M2/SY)

**FAC:** 1111

**BFR Required:** Y

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

**Planning Criteria:** NAVFAC P-80.1, Facility Planning Factors for Naval Shore Activities; Appendix C, Runway Capacity Handbook – Fixed Wing, NAVFAC P-80.3, Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations; Appendix E, Airfield Safety Clearances, UFC 3-260-01, Airfield and Heliport Planning and Design

**11110-1 DESCRIPTION.** Runways are prepared surfaces for the landing and takeoff of aircraft. The number of runways required is determined by the expected traffic density, airfield mission, operational procedures and environmental factors. Runway orientation is determined from analysis of wind data, terrain, noise levels to be generated and local development planning.

**11110-2 CRITERIA.** The following standards apply to fixed-wing runways at all Navy and Marine Corps air installations, including outlying fields, unless specifically noted otherwise. Deviation from these standards must be approved by the Naval Air Systems Command.

**11110-3 RUNWAY WIDTH.** The standard width for all runways constructed prior to June 1981 is 61 meters (200 feet). For runways planned after June 1981, the standard width shall be 61 meters (200 feet) for all Class B runways and 22.9 meters (75 feet) for Class A runways except those Class A runways where T-6, T-34, and T-44 aircraft are operated by the Naval Air Training Command. In this case, the runway width shall be

increased to 61 meters (200 feet) in order to simulate the runway conditions found at fleet stations. (See 110 introduction for explanation of class A and B Standards.)

**11110-4 LENGTH.** The maximum planned length of a runway shall be long enough to accommodate a selected critical aircraft in takeoff and landing operations under stipulated load and environmental conditions. The critical aircraft for a station is defined as one which:

- a. Is or will be assigned to the installation or is to be supported by the installation in accordance with the mission assigned by the major claimant/CNO.
- b. Requires the longest Takeoff Ground Run (TGR) or landing roll of those aircraft meeting the above stipulation.

**11110-5 CRITICAL AIRCRAFT.** The basic TGR or landing roll for the critical aircraft can be obtained from the pertinent Naval Air Training and Operating Procedures Standardization (NATOPS) Manual. Basic TGR is defined as the distance an aircraft requires to lift off at a given gross weight on a level runway surface at sea level (Barometric pressure 29.92 inches Hg.) with 59 degrees Fahrenheit ambient temperature and under conditions of zero wind. The TGR in most cases is the controlling characteristic.

Table 11110-1 provides minimum and maximum TGR and minimum and maximum landing roll for a group of selected Navy and Marine Corps aircraft. The minimum TGR (TGR min) is defined as the minimum takeoff distance an aircraft requires to lift off at minimum takeoff weight on a level runway surface at sea level (Barometric pressure 29.92 inches Hg.) with 59 degrees Fahrenheit ambient temperature and under conditions of zero wind. The maximum TGR (TGR max) is defined as the minimum takeoff distance an aircraft requires to lift-off at maximum takeoff weight (wartime weight) on a level runway surface at sea level (Barometric pressure 29.92 inches Hg.) with 59 degrees Fahrenheit ambient temperature and under conditions of zero wind. When local operating conditions are unavailable, use maximum TGR to compute runway length when TGR is the controlling characteristic.

**Table 11110-1. Selected Navy and Marine Corps Aircraft Takeoff Ground Rolls (TGR) and Landing Distances**

<b>Aircraft Type</b>	<b>Min. Takeoff Ground Roll (TGR min) (1) (feet/meters)</b>	<b>Max. Takeoff Ground Roll (TGR max) (2) (feet/meters)</b>	<b>Min. Landing Distance (feet/meters) (3)</b>	<b>Max. Landing Distance (feet/meters) (4)</b>
A-6	950/290	5,000/1,524	1,800/549	4,800/1,463
EA-6B	1,400/427	4,010/1,222	1,800/549	2,300/701
C-1	455/139	1,700/518	1,120/341	1,720/524
C-2	1,150/351	2,500/762	1,300/396	2,250/686
C-9	4,000/1,219	4,500/1,372	2,450/747	2,500/762
C-12(B)	1,680/512	1,900/579	1,000/305	1,100/335
C-12(F/M)	1,700/518	1,900/579	1,000/305	1,100/335
C-130	1,800/549	4,700/1,433	1,150/351	2,020/616
KC-130	1,820/555	4,700/1,433	1,150/351	2,020/616
E-1	600/183	1,200/366	2,550/777	2,400/732
E-2	1,200/366	2,100/640	1,300/396	1,500/457
E-6	2,980/908	5,850/1,783	2,300/701	3,820/1,164
F-4	1,200/366	3,500/1,067	2,000/610	2,500/762
F-14(A)	1,600/488	3,650/1,113	2,150/655	3,150/960
F-14(B/D)	1,800/549	4,600/1,402	2,450/747	3,000/914
F/A-18 (5)	1,000/305	3,600/1,097	2,200/671	4,300/1,311
F/A-18 (6)	1,000/305	3,400/1,036	2,200/671	4,400/1,341
F/A-18 (7)	1,305/398	3,680/1,122	Not Available	4,160/1,268
(E)P-3(A/B/E)	1,600/488	3,000/914	1,500/457	2,100/640
P-3(C)	2,100/640	4,000/1,219	1,400/427	2,100/640
(E)S-3(A/B)	1,080/329	3,400/1,036	1,750/533	2,700/823
T-2	900/274	1,600/488	1,950/594	4,300/1,311
T-28(B)	1,000/305	2,050/625	920/280	1,520/463
T-28(C)	1,000/305	2,050/625	920/280	1,940/591

**Table 11110-1. Selected Navy and Marine Corps Aircraft Takeoff Ground Rolls (TGR) and Landing Distances (Continued)**

Aircraft Type	Min. Takeoff Ground Roll (TGR min) (1) (feet/meters)	Max. Takeoff Ground Roll (TGR max) (2) (feet/meters)	Min. Landing Distance (feet/meters) (3)	Max. Landing Distance (feet/meters) (4)
T-34	1,200/366	1,400/427	850/259	1,000/305
T-39	1,400/427	2,950/899	1,550/472	4,200/1,280
T-44	1,000/305	1,500/457	950/290	1,100/335
T-45	1,340/408	2,250/686	3,200/975	3,950/1,204
AV-8(A)	825/251	2,200/671 (8)	3,500/1,067	5,000/1,524
AV-8(B)	800/244	2,600/792	3,400/1,036	8,250/2,515
(T)AV-8(B)	900/274	2,600/792	3,750/1,143	8,250/2,515
V-22	Not Available	Not Available	0/0 (9)	0/0 (9)

- Note:
- (1) Minimum takeoff distance at minimum takeoff weight.
  - (2) Minimum takeoff distance at maximum takeoff weight.
  - (3) Minimum landing ground roll required at minimum landing gross weight.
  - (4) Minimum landing ground roll required at maximum landing gross weight.
  - (5) (A/B/C/D) model Hornet with F404-GE-400 engine.
  - (6) (A/B/C/D) model Hornet with F404-GE-402 engine.
  - (7) (E/F) model Super Hornet with F414-GE-400 engine.
  - (8) Weight limited to 21.3 k-lb by tire speed.
  - (9) Vertical landing.

**11110-6 BASIC LENGTH AND CORRECTION FACTORS.** The planned runway length for an aircraft is the TGR or landing roll (whichever governs) of the critical aircraft, corrected for nonstandard conditions of altitude, temperature, and effective gradient, and with an appropriate safety factor applied. The result is rounded to the next 30.5 meters (100 feet). (Additional corrections are to be applied to crosswind runways and runways used by T-34 aircraft for basic training.) The safety factor allows for variation in pilot techniques, runway surface conditions, wind, minor mechanical difficulties, and psychological factors. Correction and safety factors are applied as follows:

**11110-6.1 Altitude.** Increase runway length (TGR or landing roll) by 1.1 percent for each 30.5 meters (100 feet) the site is above sea level. See Table 11110-2 for altitude correction factors.

**11110-6.2 Temperature.** Increase above result by 0.66 percent for each degree F the anticipated mean high temperature is above 59 degrees F. The mean highest temperature is defined as the average of the highest temperature recorded each day during the month which has the highest average daily maximum temperature. See Table 11110-2 for temperature correction factors.

**11110-6.3 Safety Factor.** Multiply the above result by 1.6 for all runways except those at Air Training Command air installations where a safety factor of 2.0 shall be applied.

**11110-6.4 Effective Gradient.** Increase the above result by 10 percent for each 1 percent of effective gradient. Effective gradient is the maximum difference in elevation along the centerline of the runway divided by the runway length and expressed as a percent.

**11110-6.5 Round off.** Final runway length is the result of the foregoing calculations rounded off to the next higher 30.5 meters (100 feet).

**11110-6.6 Basic Training Runways.** At basic training runways used by T-34 aircraft, 305 meters (1,000 feet) shall be added to the computed runway requirement. The additional runway length is required to practice precautionary emergency landings.

**11110-6.7 Example.** See the example computation at the end of Category Code 111 10.

**11110-7 CROSSWIND RUNWAY.** The foregoing discussion applies to the primary runway. When the primary runway provides less than 95 percent wind coverage (that is, when a 15 knot crosswind component occurs more than 5 percent of the time), it becomes necessary to consider a crosswind runway. Justification based on wind data and operational needs is required before planning action is taken. In those cases where a crosswind runway is authorized for planning, the length is computed as for the primary runway with the exception that the takeoff ground run (or landing roll) is reduced by 20 percent. This accounts for headwinds, 15 knots or more, which normally will be encountered on the crosswind runway. If operational conditions, wind data, or runway configuration are such as to indicate that a headwind other than 15 knots should be planned for, then the NATOPS Manual for the critical aircraft should be consulted, and the appropriate TGR computed.

**11110-8 RUNWAY SEPARATIONS/CLEARANCES.** See NAVFAC P-80.3, Airfield Safety Clearances or UFC 3-260-01, Airfield and Heliport Planning and Design for guidelines for determining obstructions to air navigation and the definition of airfield imaginary surfaces. The following lateral separations are required between runways and other airfield pavements. Deviations from criteria require a waiver from the Naval Air Systems Command unless specifically exempted from waiver per NAVFAC P-80.3.

**11110-8.1 Parallel Runways.** A minimum of 305 meters (1,000 feet) is required between centerlines of parallel runways. The separation shall be increased to 1,311 meters (4,300 feet) if simultaneous Instrument Flight Rule (IFR) operations are to be flown from the parallel runways.

**11110-8.2 Parallel Taxiway.** A minimum of 152.4 meters (500 feet) is required between the centerline of a runway and the centerline of a parallel taxiway. (Note: Aircraft using the parallel taxiway are under the direction of the air control



tower and therefore are not considered an obstruction even though the taxiway lies within the runway primary surface).

**11110-8.3 Parking Apron.** The edge of a parking apron, including its peripheral taxilane, shall be sited outside the runway primary surface. Aircraft shall be parked such that they do not penetrate the 7:1 transitional surface.

**11110-8.4 Objects.** Objects shall be sited outside the runway primary surface and such that they do not penetrate the 7:1 transitional surface or other imaginary surfaces defined in NAVFAC P-80.3.

**Figure 11110-1. Example Computation 1**

<i>The following is an illustrative example of the runway length computation:</i>			
<b>GIVEN:</b>	<i>Patrol Plane Air Station</i>	-	<i>P-3C is critical aircraft</i>
	<i>Elevation of Site</i>	-	<i>(91.5 meters) 300 feet above mean sea level</i>
	<i>Mean Highest Temperature</i>	-	<i>70 degrees (F)</i>
	<i>Effective Runway Gradient</i>	-	<i>0.8%</i>
<i>Since local operating conditions are not provided, use maximum TGR or maximum LD</i>			
<i>From Table 111-10A, TGR max (P-3C) = 1,219.5 meters (4,000 feet).</i>			
<i>From Table 111-10A, LD max (P-3C) = 640 meters (2,100 feet).</i>			
<i>Since TGR max is greater than LD max, use TGR max.</i>			
<i>Altitude Correction (1)</i>	<i>(91.5) 300</i>	$\times 1.1\% = 3.3\%$	
	<i>(30.5) 100</i>		
			$1,219.5 (4,000) \times 1.033 = 1,259.7 \text{ meters } (4,132 \text{ feet})$
<i>Temperature Correction (1)</i>	<i>(70-59)</i>	$\times 0.66\% = 7.26\%$	
			$1,259.7 (4,132) \times 1.0726 = 1,351.1 \text{ meters } (4,432 \text{ feet})$
<i>Safety Factor Correction</i>	<i>1,351.1 meters (4,432 feet)</i>	$\times 1.6 = 2,161.8 \text{ meters } (7,091 \text{ feet})$	
<i>Effective Gradient</i>	<i>0.8</i>	$\times 10\% = 8\% \text{ increase}$	
			$2,161.8 \text{ meters } (7,091 \text{ feet}) \times 1.08 = 2,334.7 \text{ meters } (7,658 \text{ feet})$

Note: (1) Table 111-10B may be used when temperature and altitude data are available.

## Figure 11110-2. Example Computation 2

The following is an illustrative example of the runway length computation:

**GIVEN:** Air Station - F/A-18 "Hornet" w/ F404-GE-402 engine is critical aircraft  
 - (15.2 meters) 50 feet above

Mean Highest Temperature - 80 degrees (F)  
 Effective Runway Gradient - 0.5%

Since local operating conditions are not provided, use maximum TGR or maximum LD  
 From Table 111-10A, TGR max (F/A-18 w/F404-GE-402) = 1,036 meters (3,400 feet).  
 From Table 111-10A, LD max (F/A-18 w/F404-GE-402) = 1,341 meters (4,400 feet).

Since LD max is greater than TGR max, use LD max.

Altitude Correction (1)  $\frac{(15.2) 50}{(30.5) 100} \times 1.1\% = 0.55\%$

$1,341 (4,400) \times 1.0055 = 1,348.4 \text{ meters } (4,424 \text{ feet})$

Temperature Correction (1)  $(80-59) \times 0.66\% = 13.86\%$

$1,348.4 (4,424) \times 1.1386 = 1,535.3 \text{ meters } (5,037 \text{ feet})$

Safety Factor Correction  $1,535.3 \text{ meters } (5,037 \text{ feet}) \times 1.6 = 2,456.5 \text{ meters } (8,059 \text{ feet})$

Effective Gradient  $0.5 \times 10\% = 5\% \text{ increase}$

$2,456.5 \text{ meters } (8,059 \text{ feet}) \times 1.05 = 2,579.3 \text{ meters } (8,462 \text{ feet})$

Round off = 2,591.5 meters (8,500 feet).

Note: Table 11110-2 may be used when temperature and altitude data are available.

Table 11110-2. Runway Temperature and Altitude Corrections

Installation	Elevation (feet/meters)	Mean Highest daily temp. hottest month (Deg. F)	Altitude Correction Factor	Temperature Correction Factor
Andrews, AFB	280 / 85.4	89	1.0308	1.198
Aransas, AP	24 / 7.3	90	1.0026	1.2046
Atlanta, NAS	1,068 / 325.6	89	1.1175	1.198
Atlantic, MCOLF	20 / 6.1	89	1.0022	1.198
Atsugi, NAF	205 / 62.5	87	1.0226	1.1848
Barin Field, NOLF	54 / 16.5	91	1.0059	1.2112
Barking Sands, NS	16 / 4.9	87	1.0018	1.1848
Beaufort, MCAS	36 / 11.0	91	1.004	1.2112
Bogue Field, MCALF (1)	22 / 6.7	89	1.0024	1.198
Brewton Field, NOLF	99 / 30.2	91	1.0109	1.2112
Brunswick, NAS	75 / 22.9	80	1.0083	1.1386
Cabaniss Field, NOLF	30 / 9.1	93	1.0033	1.2244
Camp Davis, MCOLF	60 / 18.3	90	1.0066	1.2046
Camp Pendleton, MCAS	73 / 22.3	82	1.008	1.1518
Cherry Point, MCAS	28 / 8.5	89	1.0031	1.198
China Lake, NAWS	2,283 / 696.0	103	1.2511	1.2904
Choctaw, NOLF	102 / 31.1	91	1.0112	1.2112
Corpus Christi, NAS	19 / 5.8	93	1.0021	1.2244
Coupeville, NOLF	199 / 60.7	72	1.0219	1.0858
Diego Garcia, NSF	9 / 2.7	88	1.001	1.1914
Doha, IAP	35 / 10.7	106	1.0039	1.3102
El Centro, NAF	3,28125	105	0.9946	1.3036
Middleton Field (Evergreen), NOLF	260 / 79.3	91	1.0286	1.2112
Fallon, NAS	3,934 / 1,199.4	93	1.4327	1.2244
Fentress, NALF	16 / 4.9	87	1.0018	1.1848
Fort Worth, NAS JRB	650 / 198.2	97	1.0715	1.2508

Table 11110-2. Runway Temperature and Altitude Corrections (Continued)

Installation	Elevation (feet/meters)	Mean Highest daily temp. hottest month (Deg. F)	Altitude Correction Factor	Temperature Correction Factor
Fujairah, IAP	152 / 46.3	94	1.0167	1.231
Futema, MCAS	247 / 75.3	87	1.0272	1.1848
Guantanamo Bay, NAS	56 / 17.1	93	1.0062	1.2244
Harold Field, NOLF	150 / 45.7	92	1.0165	1.2178
Holley Field, NOLF	39 / 11.9	91	1.0043	1.2112
Hurghada, EG	52 / 15.8	92	1.0057	1.2178
Ie Jima, AAF	246 / 75.0	88	1.0271	1.1914
Imperial Beach, NOLF	24 / 7.3	78	1.0026	1.1254
Iwakuni, MCAS	7 / 2.1	88	1.0008	1.1914
Jacksonville, NAS	22 / 6.7	91	1.0024	1.2112
Jeddah, AB	48 / 14.6	90	1.0053	1.2046
Joe Williams, NOLF	540 / 164.6	93	1.0594	1.2244
Kaneohe Bay, MCAF	17 / 5.2	83	1.0019	1.1584
Keflavik, NAS	171 / 52.1	55	1.0188	0.9736
Key West, NAF	6 / 1.8	90	1.0007	1.2046
Kingsville, NAS	50 / 15.2	95	1.0055	1.2376
Lakehurst, NAES	103 / 31.4	86	1.0113	1.1782
Lemoore, NAS	234 / 71.3	98	1.0257	1.2574
Masirah, AB	64 / 19.5	95	1.007	1.2376
Mayport, NS	17 / 5.2	91	1.0019	1.2112
Meridian, NAS	317 / 96.6	93	1.0349	1.2244
Miramar, MCAS	478 / 145.7	78	1.0526	1.1254
Misawa, NAF	119 / 36.3	81	1.0131	1.1452
Muharraq, BH	6 / 1.8	108	1.0007	1.3234
Naha, NAF	11 / 3.4	88	1.0012	1.1914
Naples (Capodichino), NSA	294 / 89.6	85	1.0323	1.1716

**Table 11110-2. Runway Temperature and Altitude Corrections (Continued)**

<b>Installation</b>	<b>Elevation (feet/meters)</b>	<b>Mean Highest daily temp. hottest month (Deg. F)</b>	<b>Altitude Correction Factor</b>	<b>Temperature Correction Factor</b>
New Orleans, NAS JRB	3 / 0.9	92	1.0003	1.2178
New River, MCAS(H)	25 / 7.6	90	1.0028	1.2046
North Island, NAS	26 / 7.9	75	1.0029	1.1056
Norfolk, NS Chambers Field	15 / 4.6	88	1.0017	1.1914
Oak Grove, MCOLF	27 / 8.2	88	1.003	1.1914
Oceana, NAS	22 / 6.7	87	1.0024	1.1848
Orange Grove, NALF	257 / 78.3	95	1.0283	1.2376
Pace Field, NOLF	180 / 54.9	91	1.0198	1.2112
Patuxent River, NAS	39 / 11.9	86	1.0043	1.1782
Pensacola, NAS	30 / 9.1	91	1.0033	1.2112
Point Mugu, NAS	12 / 3.7	75	1.0013	1.1056
Quantico, MCAS	11 / 3.4	88	1.0012	1.1914
Roosevelt Roads, NS	38 / 11.6	88	1.0042	1.1914
Rota, NS	86 / 26.2	85	1.0095	1.1716
San Clemente, NALF	182 / 55.5	79	1.02	1.132
San Nicolas, NOLF	504 / 153.7	79	1.0554	1.132
Santa Rosa, NOLF	150 / 45.7	92	1.0165	1.2178
Saufley Field, NOLF	85 / 25.9	91	1.0094	1.2112
Sigonella, NAS	81 / 24.7	89	1.0089	1.198
Silverhill, NOLF	129 / 39.3	91	1.0142	1.2112
Souda Bay, NSA	492 / 150	84	1.0541	1.165
Spencer Field, NOLF	151 / 46.0	92	1.0166	1.2178
Summerdale Field, NOLF	149 / 45.4	91	1.0164	1.2112
Taszar, AB	526 / 160.4	79	1.0579	1.132
29 Palms, MCAGCC (1)	2,055 / 626.5	106	1.2261	1.3102
Waldron Field, NOLF	25 / 7.6	93	1.0028	1.2244
Whidbey Island, NAS	47 14.3	67	1.0052	1.0528

**Table 11110-2. Runway Temperature and Altitude Corrections (Continued)**

Installation	Elevation (feet/meters)	Mean Highest daily temp. hottest month (Deg. F)	Altitude Correction Factor	Temperature Correction Factor
Whitehouse, NOLF	99 / 30.2	91	1.0109	1.2112
Whiting Field (North)	200 / 61.0	92	1.022	1.2178
Willow Grove, NAS JRB	362 / 110.4	87	1.0398	1.1848
Wolf, NOLF	61 / 18.6	91	1.0067	1.2112
Yuma, MCAS	213 / 64.9	107	1.0238	1.3168

Note: (1) Expeditionary airfields – exempt from P-80.3 criteria.

### **111 12 RUNWAY/FIXED WING - UNSURFACED (M2/SY)**

**FAC: 1114**

**BFR Required: Y**

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

**Planning Criteria:** NAVFAC P-80.3, Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations; Appendix E, Airfield Safety Clearances, UFC 3-260-01, Airfield and Heliport Planning and Design

**11112-1 DESCRIPTION.** Runways for rotary wing aircraft that do not consist of a pavement or hardstand surface. More specific planning criteria is planned for development.

### **111 15 RUNWAY/ROTARY WING (M2/SY)**

**FAC: 1112**

**BFR Required: Y**

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

**Planning Criteria:** NAVFAC P-80.3, Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations; Appendix E, Airfield Safety Clearances, UFC 3-260-01, Airfield and Heliport Planning and Design

**11115-1 DESCRIPTION.** Runways/rotary wing are prepared surfaces for the landing and takeoff of helicopters. For planning purposes, helicopter landing/takeoff surfaces greater than 121.9 meters (400 feet) in length shall be considered a runway. Pavements equal to or less than 121.9 meters (400 feet) in length and-width (or diameter) shall be classified as Category Code 111 20, Helicopter Landing Pad. See UFC 3-260-01, Airfield and Heliport Planning and Design for planning and design criteria and NAVFAC P-80.3, Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations; Appendix E, Airfield Safety Clearances for airfield safety clearances.

**11115-2 CRITERIA.** The basic rotary wing runway described below is designed to support normal takeoff and landing operations and may be increased in length when training exercises are to be conducted from the runway. Due to the multiple missions assigned to helicopters and the flexibility of their operating methods, standard size training pavements are difficult to define. However, a 305 meter (1,000 foot) long runway (no temperature and altitude correction is applied) is considered sufficient to conduct proficiency training and autorotation exercises for most Navy air installations.

**11115-2.1 Width.** The standard width for rotary wing runways is 22.9 meters (75 feet). Rotary wing runways which support CH-53 or any helicopter with rotor diameter greater than 21.3 meters (70 feet) shall have a width of 30.5 meters (100 feet).

**11115-2.2 Length.** The basic rotary wing runway length is 487.8 meters (1,600 feet) corrected for elevation and temperature. For facilities constructed prior to November 2001, the basic rotary wing runway length is 137.2 meters (450 feet).

- a. Altitude Correction. Altitude correction. Increase the rotary wing runway length by 10 percent for each 305 meters (1,000 feet) the runway elevation is above 610 meters (2,000 feet) Mean Sea Level (MSL).
- b. Temperature Correction. Increase the rotary wing runway length by 4.0 percent for each 10°F that the average daily maximum temperature for the hottest month is above 59°F.

**11115-3 MULTIPLE TOUCHDOWN POINTS.** Where multiple touchdowns points are provided on a single rotary wing runway, the touchdown points shall be spaced a minimum of 121.9 meters (400 feet) center to center.

**11115-4 RUNWAY CONFIGURATIONS.** Multiple rotary wing runway configurations that may be planned include parallel runways or arranging three runways as each side of a triangle. Distance between centerlines of Parallel Rotary Wing Runways (Visual Flight Rules (VFR) without intervening parallel taxiway between centerlines is a minimum of 213.4 meters (700 feet).

**11115-5 DISTANCE FROM CENTERLINE.** Distance from the centerline of a Fixed Wing Runway to the centerline of a parallel Rotary Wing Runway under various conditions is as follows:

- a. Simultaneous VFR operations for Class A Runway = 213.4 meters 700 feet)
- b. Simultaneous VFR operations for Class B Runway = 305 meters (1,000 feet)
- c. Instrument Flight Rules (IFR) using simultaneous operations (depart-depart or depart-approach) = 762.2 meters (2,500 feet)
- d. IFR using simultaneous approaches = 1,311 meters (4,300 feet)

**11115-6 IFR OPERATIONS.** For rotary wing runways designed for IFR operations, the runway design must take into account the Ground Control Approach (GCA) system

to be used and the number of instrumented touchdown points required. For example, two touchdown points located at opposite ends of a 305 meter (1,000 foot) runway could be served by a single GCA located on a turn table offset near the mid point of the runway.

**11115-7 AIRCRAFT SAFETY CLEARANCES.** The location of objects adjacent to rotary wing runways is governed by the runway primary surface, transitional surface, and approach/departure surface. These surfaces differ for IFR and VFR operations and are defined in NAVFAC P-80.3. Also see P-80.3 for takeoff safety zone criteria for VFR rotary runways.

## **111 20 HELICOPTER LANDING PAD/HOVERPOINT (M2/SY)**

**FAC: 1112**

**BFR Required: Y**

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

**Planning Criteria:** NAVFAC P-80.3, Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations; Appendix E, Airfield Safety Clearances, UFC 3-260-01, Airfield and Heliport Planning and Design

**11120-1 DESCRIPTION.** A helicopter landing pad (helipad) is a prepared area for the hovering, vertical takeoff and landing (VTOL) of helicopters and other VTOL aircraft. The pad is designed to accommodate only one helicopter/VTOL aircraft at a time. The pad may service a hospital, administrative activity, command headquarters or other installations which require helicopter cargo or passenger service. Helipads may be planned at fixed wing air installations, but only if air traffic density or safety requirements preclude the use of the fixed wing runways by helicopters. See UFC 3-260-01 for design criteria.

**11120-2 HOVERPOINT.** A hoverpoint is a prepared and marked surface used as a reference or control point for air traffic control purposes by arriving or departing helicopters. A hoverpoint is generally located in non-traffic areas. See UFC 3-260-01 for design criteria.

### **11120-2.1 Types of Helipads.**

- a. Standard VFR Helipad. VFR standards are used when no permanent requirement exists or will exist in the future for an IFR helipad.
- b. Limited Use Helipad. This is a VFR helipad used at sites where only occasional operations are conducted. These sites may be, but are not limited to, hospitals, headquarter areas, missile sites, and established airfields or heliports where the Limited Use Helipad may be used to preclude mixing helicopters and fixed-wing traffic. Limited Use Helipads may also be used to separate lighter helicopter (12,500 lbs (5,670 kg) or less) from medium and heavy helicopter traffic.
- c. IFR Helipad. IFR standards are used when an instrument approach capability is essential to the mission and no other instrument landing



facilities, either fixed wing or rotary wing, are located within an acceptable commuting distance to the site.

**11120-3 HELIPAD LOCATION.** Helipad location should be selected with regard to mission requirements, overall facility development, approach-departure surfaces, and local wind conditions. When a helipad is to be located near fixed and rotary wing runways, its location should be based on type of operations. Construction of helipads on buildings or on any type of elevated structure above ground shall be subject to review and approval by Naval Air Systems Command.

**11120-4 STAND-BY PARKING.** At individual helipad sites where it is necessary to have one or more helicopters on standby, an area adjacent to the helipad, but clear of the landing approach and transitional surfaces, should be designated for standby parking. This area is designated as a parking apron (see Category Code 113 20, Aircraft Parking Apron)

**11120-5 SAME DIRECTION INGRESS/EGRESS.** Helipads with same direction ingress/egress allow a helicopter pad to be located in a confined area where approach-departures are made from only one direction. The approach may be either VFR or IFR. Same direction ingress/egress helipads must be individually justified and approved by NAVAIRSYSCOM. See UFC 3-260-01, Airfield and Heliport Planning and Design for typical same direction ingress/egress helipad.

**11120-6 CRITERIA.** The standard helipad is 30.5 meters by 30.5 meters (100 feet by 100 feet) (930.3 square meters (1,100 square yards)) for both Visual Flight Rule (VFR) and Instrument Flight Rule (IFR) operations. The size may be modified to accommodate specific training or mission requirements, for example, a shipboard-sized pad (approximately 15.2 meters by 15.2 meters (50 feet by 50 feet) for shipboard landing practice. Individual justification must be provided. Where more than one helicopter is to be at the pad location at one time, a connecting taxiway and parking apron is required. Helipads at VTOL training air stations (helipads servicing VTOL aircraft) should be 61.0 meters by 91.4 meters (200 feet by 300 feet) (5,575.4 square meters (2,222 square yards)). The standard hoverpoint is 9.1 meters (30 feet) in diameter.

**11120-7 AIRFIELD SAFETY CLEARANCES.** The location of objects adjacent to helipads and hoverpoints is governed by the primary surface, take off safety zone, transitional surface and approach departure surface. These surfaces differ for IFR and VFR operations and are defined in NAVFAC P-80.3, Airfield Safety Clearance and UFC 3-260-01, Airfield and Heliport Planning and Design.

## **111 25 FIXED WING AIRCRAFT (VTOL) LANDING PAD**

**FAC: 1111**

**BFR Required: Y**

**11125-1 DESCRIPTION.** No criteria are currently available for this category code. It is currently being developed and will be updated as soon as it is complete.

**111 30 RUNWAY OVERRUN-PAVED SURFACE (M2/SY)**

**FAC: 1113**

**BFR Required: Y**

**111 30 RUNWAY OVERRUN – PAVED SURFACED (M2/SY)**

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design  
 UFC 3-260-02, Pavement Design for Airfields

**Planning Criteria:** NAVFAC P-80.3, Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations; Appendix E, Airfield Safety Clearances, UFC 3-260-01, Airfield and Heliport Planning and Design

**11130-1 DESCRIPTION.** Runway overruns are areas extending at each end of a runway. The runway overrun areas are required to reduce serious damage to an aircraft in the event that the aircraft runs off of the runway end during takeoff or landing. These overrun areas are sometimes paved or unpaved. It is recommended that the areas be paved to provide a more stable surface to support aircraft wheel loads.

**11130-2 CRITERIA.** Table 11130-1 provides the dimensional requirements for the overrun areas for Class A and Class B runways.

Table 11130-1 Runway Overruns				
Item		Class A Runway	Class B Runway	Remarks
No.	Description	Requirement		
1	Length (paved)	300 m (1,000 ft)		Navy and Marine Corps airfields  At outlying fields for T-34 aircraft, the required overrun length is 150 m (500 ft).
2	Total width of overrun (paved)	Sum of runway and shoulders		The outside edges of the overrun, equal in width to the runway shoulder are graded, but not paved.
3	Paved overrun	Same as width of runway		Center on runway centerline extended to length of the overrun
4	Longitudinal centerline grade	First 60 m (200 ft) same as last 300 m (1,000 ft) of runway. Remainder: 1.5 percent Maximum	First 90 m (300 ft) same as last 900 m (3,000 ft) of runway. Remainder: 1.5 percent Maximum	To avoid abrupt changes in grade between the first 90 m (300 ft) and remainder of overrun of a Class B runway, the maximum change of grade is 2.0 percent per 30 linear m (100 linear ft.).
5	Transverse grade	Minimum 2.0 percent Maximum 3.0 percent 40 mm (1.5 in) drop-off At edge of paved overrun +/- 13 mm (0.5 in)		From the centerline of the overrun; Transition from the runway and runway shoulder grades to the overrun grades to be made within the first 45 m (150 ft) of overrun.

## 112 AIRFIELD PAVEMENTS – TAXIWAYS

**112-1 DESCRIPTION.** This basic category covers aircraft taxiway pavements and includes both normal and high speed runway exits. Criteria for peripheral and interior taxi lanes of aircraft parking aprons are included in Category Code 113 20, Aircraft Parking Apron.

### 112 10 TAXIWAY (M2/SY)

**FAC: 1121**

**BFR Required: Y**

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

**Planning Criteria:** NAVFAC P-80.3, Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations; Appendix E, Airfield Safety Clearances; UFC 3-260-01, Airfield and Heliport Planning and Design

**11210-1 DESCRIPTION.** Taxiways are paved surfaces on which aircraft, both fixed and rotary wing, move under their own power to and from landing, service and parking areas. Criteria for surfaces for towing aircraft are included in Category Code 116 50, Towway.

### 11210-2 TAXIWAY TYPES.

**11210-2.1 Basic.** The basic airfield layout consists of a taxiway connecting the center of the runway with parking apron. This system limits the number of aircraft operations at an airfield. Departing aircraft must taxi on the runway to reach the runway threshold. When aircraft are taxiing on the runway, no other aircraft is allowed to use the runway. If runway operations are minimal or capacity is low, the basic airfield layout with one taxiway may be an acceptable layout.

**11210-2 Parallel Taxiway.** A taxiway parallel for the length of the runway, with connectors to the end of the runway and parking apron, is the most efficient taxiway system. Aircraft movement is not hindered by taxiing operations on the runway and the connectors permit rapid entrance and exit to traffic.

**11210-2.3 High Speed Taxiway Turnoff.** High speed taxiway turnoffs are located intermediate of the ends of the runways to increase the capacity of the runway. The high-speed taxiway turnoff enhances airport capacity by allowing aircraft to exit the runways at a faster speed than turnoff taxiways allow.

**11210-2.4 Additional Types of Taxiways.** Besides the types of taxiways above, there are other taxiways at an airfield. Taxiways are often referred to based on their function. Common airfield taxiways include, but are not limited to, crossover, connecting, bypass, acute angle, intermediate, and ladder.

**11210-2.5 Peripheral and Interior Taxilanes.** A taxi route through or around an apron is referred to as a taxilane. Taxilanes are generally an integral part of the

aircraft parking apron and as such as included under Category Code 113 20, Aircraft Parking Apron.

**11210-3 CRITERIA.** The length of a taxiway depends upon the specific airfield configuration and layout of support facilities. Taxiways are normally 22.9 meters (75 feet) wide. For taxiways which only support Class "A" fixed wing runways or helicopter landing pavements, the taxiway width shall be reduced to a 12.2 meters (40 feet). (See Code 110 introduction for a definition of Class A and B fixed wing runways.) Runway exits are part of the taxiway system and include end, normal intermediate and high-speed turn-offs.

**11210-4 EXITS FOR CLASS B FIXED WING RUNWAYS:** End turn-offs are planned for each runway end and are 45.7 meters (150 feet) wide, except those from parallel runways to the parallel taxiway which are 61 meters (200 feet) wide. Normal intermediate turn-offs are required for all runways. They are 22.9 meters (75 feet) wide and are placed 610 meters (2,000 feet) from each end of the runway and in the remaining runway length at intervals of not more than 915 meters (3,000 feet) or less than 610 meters (2,000 feet). High-speed turn-offs are provided where traffic studies indicate the requirement. High-speed turn-offs are 30.5 meters (100 feet) wide at the throat tapering to 22.9 meters (75 feet) and are a minimum of 305 meters (1,000 feet) long.

**11210-5 EXITS FOR CLASS A FIXED WING RUNWAYS AND ROTARY WING RUNWAYS:** End turn-offs and intermediate taxiways shall be 12.2 meters (40 feet) in width.

**11210-6 SAFETY CLEARANCES/SEPARATIONS:** Taxiways are located so as to provide adequate clearance between taxiing aircraft and aircraft in adjacent areas and obstacles. The following separation clearances apply to the siting of taxiways. The use of separations less than specified requires a waiver from the Naval Air Systems Command. The minimum clearance from the centerline of the fixed wing taxiway to:

	Class "A" Fixed Wing Runway	Class "B" Fixed Wing Runway
Centerline of Parallel Runways	152.4 meters (500 feet)	152.4 meters (500 feet)
Centerline of Parallel Taxiways	53.3 meters (175 feet)	72.4 meters (237.5 feet) or wingspan + 15.2 meters (50 feet), whichever is greater
Edge of Parking Apron	30.5 meters (100 feet)	45.7 meters (150 feet) (1) (2)
Obstacles (fixed or mobile)	45.7 meters (150 feet) (3)	45.7 meters (150 feet)

- Note:
- (1) The parking apron must be sited outside the runway primary surface. Because of this requirement, the apron will normally be a greater distance than 45.7 meters (150 feet) from the parallel taxiway of a Class "B" fixed wing runway.
  - (2) Under certain conditions, a through taxiway may be incorporated within the parking apron as a peripheral taxiway. See the paragraph titled "Deviation for Criteria", Category Code 113 20 (Aircraft Parking Apron).
  - (3) Reduce to 30.5 meters (100 feet) along rotary wing taxiways.

See UFC 3-260-01, Airfield and Heliport Planning and Design for design criteria related to taxiway grades and shoulders.

## 113 AIRFIELD PAVEMENTS – APRONS (INCLUDES AIRCRAFT PARKING AND ACCESS APRONS)

### 113 20 AIRCRAFT PARKING APRON (M2/SY), REVISED NOV 2011

FAC: 1131

BFR Required: Y

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design  
**Planning Criteria:** NAVFAC P-80.3, Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations; Appendix E, Airfield Safety Clearances; UFC 3-260-01, Airfield and Heliport Planning and Design

**11320-1 DESCRIPTION.** Aircraft parking aprons are required for loading, unloading and servicing of aircraft in addition to providing parking space. There is no standard size or apron configuration. The size is based on the type and number of aircraft to be parked, the requirement for squadron integrity and 45 versus 90 degree parking. The area required includes: parking space, wing-tip separation between aircraft, interior taxilanes and peripheral taxilanes. Aprons used for ordnance handling require special siting considerations, see Category Codes 116 55, Ordnance Handling Pad and 116 56, Combat Aircraft Ordnance Loading Area. For design criteria, see UFC 3-260-01, Airfield and Heliport Planning and Design.

**11320-2 CRITERIA.** In some cases, these criteria will refer to standards for aprons supporting Class A or B aircraft. (See section 110 introduction for explanation of Class A and B standards.) The determination of the apron requirement involves the following steps:

1. Determine the number of aircraft parking spaces required.
2. Layout the parking spaces using the dimensions given herein for clearances between aircraft and interior taxilanes.
3. Provide peripheral taxiways around the perimeter of the apron.

**11320-3 NUMBER OF PARKING SPACES.** The number of parking spaces required is based on the average number of aircraft on-board (including transients) reduced by a factor to reflect the number of aircraft expected to be in hangars for scheduled organizational maintenance. For planning purposes, assume that the following percentages of the average on-board aircraft assigned organizational maintenance at a station will be in the hangar for scheduled maintenance:

33% - Carrier and Rotary Wing aircraft  
 17% - Patrol, Special Mission, and Training aircraft  
 11% - Transport aircraft

**11320-3.1** The above reductions apply except that the reduction to the number of apron parking spaces shall not exceed 50 percent of the hangar spaces available.

**11320-3.2** Where organizational maintenance is provided by a commercial contractor, the average number of aircraft in hangars for scheduled maintenance shall be determined on an individual basis. Where an air installation is subject to peak loadings on a regular basis for training exercises or overlap of deployable squadrons, individual justification may be provided for additional spaces to support peak loadings.

**11320-3.3 Example Computation:** A station supports 6 fleet operational F/A-18 squadrons. Each squadron has 12 aircraft. Determine the number of parking apron spaces required.

- a. F/A-18 aircraft are categorized as Carrier aircraft.
- b. Total number of aircraft =  $6 \times 12 = 72$
- c. Reduction for aircraft assigned organizational maintenance (i.e. parked in aircraft maintenance hangar) (for Carrier aircraft) =  $72 \times 33\% = 23.8 = 24$  (rounded to next whole number). However, the reduction shall not exceed 50% of the aircraft maintenance hangar space available. Therefore, the total reduction for aircraft assigned organizational maintenance (i.e. parked in aircraft maintenance hangar) =  $24 \times 50\% = 12$
- d. Number of aircraft requiring apron parking apron spaces =  $72 - 12 = 60$

**11320-4 SPACING OF AIRCRAFT.** The following Tables and Figures provide dimensions for apron spacing and typical apron configurations:

Table 11320-1 – Parking Apron Spacing – Jet Aircraft: 45 Degree Parking  
 Table 11320-2 – Parking Apron Spacing – Jet Aircraft: 90 Degree Parking  
 Table 11320-3 – Parking Apron Spacing – Propeller Aircraft: 90 Degree Parking  
 Table 11320-4 – Parking Apron Spacing – Helicopters: 90 Degree Parking  
 Figure 11320-1 – 90-Degree Aircraft Parking Configuration  
 Figure 11320-2 – 45-Degree Aircraft Parking Configuration  
 Figure 11320-3 – Typical Aircraft Parking Apron  
 Figure 11320-4 – Aircraft Parking Apron, Fixed Wing Aircraft, Minimal Through Traffic  
 Figure 11320-5 – Minimum Peripheral Taxilane, Fixed Wing Aircraft

**11320-4.1 Jet Blast Protection.** Parked aircraft must be separated to maintain proper wing-tip clearances, interior taxilane widths and protection from jet blast. Jet blast protection is achieved by providing the space necessary to dissipate the temperature and velocity of the jet blast to levels that will not injure or damage aircraft personnel and equipment. Typically, this level is approximately 100 degrees

Fahrenheit (38 degrees Celsius) and 30.4 knots (35 mph). This level can be easily achieved by parking carrier based aircraft at 45 degrees with their engine blast aimed into the interior taxilane, providing safe and adequate jet blast dispersion (see Table 11320-1 and Figure 11320-2).

**11320-4.2 Deviations from Efficient Configuration.** The most efficient apron size results from parking jet aircraft at either a 45-degree or 90-degree angle, and propeller aircraft and helicopters at a 90-degree angle to the interior taxilane. Use of the most efficient configuration is preferred. Factors impacting designs for aircraft parking configurations could include space availability, operational constraints, type and number of aircraft, taxiing or towing procedures, and clearances. See Figures 11320.1 and 11320.2 for the 45 and 90-degree configurations and the description of the A, B, C, D and E dimensions used for apron spacing. Tables 11320.1, Table 11320.2, Figure 11320.3 and Figure 11320.4 provide the spacing dimensions, which shall be used for Basic Facility Requirements determination. The apron spacing dimensions may be modified when a Fixed Point Utility System (FPUS), starting air and electrical service, or Flightline Electrical Distribution System (FLEDS), electrical system is to be installed in the apron. The FPUS or FLEDS service points and the parking spaces are spaced to accommodate all Navy fighter and attack aircraft rather than designed for a particular aircraft. Aprons with FPUS or FLEDS may be planned using an "A + D" dimension of 44.2 meters (145 feet) and a "C" dimension of 21.6 meters (71 feet), assuming 45 degree parking. For aprons which are expected to support S-3 aircraft, the "A + D" may be increased to 45.7 meters (150 feet).

**11320-5 PERIPHERAL TAXILANES.** A peripheral taxilane is normally provided on all sides of an aircraft parking apron. The MC-4 Triton does not require peripheral taxilane. Movement of this aircraft in and out of hangar and inside an apron is achieved with a towing tractor. The standard width is 45.7 meters (150 feet) except for those aprons which support only helicopters and no future requirement to support fixed wing aircraft can be identified. In this case the width shall be computed as:

$$\text{Width} = 1.5 \times (\text{Rotor Diameter}) + 6.1 \text{ meters (20 feet)}$$

**11320-5.1** Use the largest rotor diameter of those helicopters expected to use the apron. This width provides a 12.2 meter (40 foot) taxilane with a one rotor diameter clearance between taxiing and parking helicopters.

**11320-6 SAFETY/LATERAL CLEARANCES.** See NAVFAC P-80.3, Airfield Safety Clearances and UFC 3-260-01, Airfield and Heliport Planning and Design for the definition and application of airfield safety clearances. Parking aprons shall be sited outside the primary surface of the runway (or helipad). The edge of the apron may be adjacent to the outer edge of the primary surface, however, parked aircraft shall not penetrate the transitional surface.

**11320-7 DISTANCE FROM APRON EDGE.** Aircraft taxiing on the peripheral taxilane are not considered obstructions even though they do penetrate the transitional surface. The apron edge shall be a minimum of 45.7 meters (150 feet) from the

centerline of any parallel taxiway of the runway system. The minimum distance any object, except maintenance hangars, shall be sited from the apron edge is:

- a. for Class "A" aircraft aprons: 22.9 meters (75 feet)
- b. for Class "B" aircraft aprons: 30.5 meters (100 feet)
- c. for Helicopters aprons: 22.9 meters (75 feet) (Note: increase to 30.5 meters (100 feet) where the CH-53 is assigned to an apron)

**11320-8 MAINTENANCE HANGAR OFFSET FROM APRON.** Maintenance hangars opening to the apron shall be offset 15.2 meters (50 feet) from the apron edge. For criteria for this 15.2 meter (50 foot) access pavement to the hangar see Category Code 113-40, Aircraft Access Apron.

**11320-9 DEVIATION FROM CRITERIA:** The 45.7 meter (150 foot) separation between an aircraft parking apron and the centerline of a through taxiway must be maintained when the taxiway is expected to carry a substantial amount of through traffic; i.e., traffic other than that which starts or terminates at that particular apron. When the anticipated amount of through traffic is minimal and is so justified to NAVAIRSYSCOM, a parking apron may be located such that the through taxiway is incorporated within the apron peripheral taxilane, see Figure 11320.4. However, in this case, the through taxiway becomes a part of the apron and therefore must be located outside the runway primary surface. Any savings in pavement to be gained by combining taxiways shall be compared to any increases in pavement for runway turnoffs required due to moving the parallel taxiway outside the runway primary surface. Combined taxiways shall not be planned without prior approval of NAVAIRSYSCOM.

**11320-10** Figure 11320-3 indicates that 45.7 meter (150 foot) wide peripheral taxilanes are to be provided on all sides of fixed wing aircraft parking aprons. Although such an arrangement is desirable, it is not always necessary. When small numbers of aircraft (one or two rows) are to be parked or when operational requirements allow, the number and/or width of the peripheral taxilanes may be reduced on the advice of local air operations personnel, subject to NAVAIRSYSCOM approval. See Figures 11320-3/11320-4 which indicate which fixed wing aircraft peripheral taxilanes may be reduced. The 45.7 meter (150 foot) wide taxilane is designed to accommodate two carrier type aircraft when passing and therefore could be reduced in width if the level of apron operations only require one aircraft to be on the taxilane at a time. In this case, the taxilane shall be sized to accommodate the largest aircraft to be parked on the apron. See Figure 11320-5 which provides a sketch of the minimum taxilane clearances. Peripheral taxilanes for helicopters shall not be reduced from the dimensions shown in Table 11320-1.

**11320-11** Tables 11320-1, 11320-2, 11320-3 and 11320-4 list aircraft by type and include all models, such as the S-3 aircraft type which includes S-3A, S-3B, ES-3A, US-3A, and YS-3A. However, in some instances there are size differences between models of the same aircraft, such as the F/A-18A and the F/A-18E. In these cases, the particular aircraft type is also further defined by the model to which the data applies.



Table 11320-1. Parking Apron Spacing Jet Aircraft: 45 Degree Parking

Aircraft Type	Wingspan		Length		A	B	C	D	E
	(ft/in)	(m)	(ft/in)	(m)	(ft/m)	(ft/m)	(ft/m)	(ft/m)	(ft/m)
A-4	27' 6"	8.38	39' 5"	12	31/9.5	31/9.5	53/16.1	90/27.4	150/45.7
A-6	53' 0"	16.1	54' 6"	16.6	47/14.3	47/14.3	96/29.3	90/27.4	150/45.7
A-7	40' 4"	12.3	56' 0"	17.1	39/11.9	39/11.9	71/21.6	90/27.4	150/45.7
AV-8	30' 4"	9.2	46' 4"	14.1	36/11	36/11	57/17.4	90/27.4	150/45.7
EA-6B	53' 0"	16.1	59' 10"	18.2	47/14.3	47/14.3	96/29.3	90/27.4	150/45.7
F-35B	35' 0"	10.7	51' 3"	15.6	45/13.7	45/13.7	65/19.8	141/43.0	150/45.7
F-35C	43' 0"	13.1	51' 4"	15.6	47/14.3	47/14.3	65/19.8	141/43.0	150/45.7
F-4	38' 5"	11.7	58' 3"	17.7	47/14.3	47/14.3	70/21.3	90/27.4	150/45.7
F-5E	28' 0"	8.5	48' 3"	14.6	-2	-2	-2	-2	150/45.7
F-5F	28' 0"	8.5	51' 8"	15.5	-2	-2	-2	-2	150/45.7
F-14	64' 2"	19.5	62' 8"	19.1	56/17.1	56/17.1	106/32.3	95/28.9	150/45.7
F-14(1)	38' 3"	11.7	62' 8"	19.1	55/17.1	55/17.1	70/21.3	90/27.4	150/45.7
F/A-18A,B,C,D	40' 5"	12.3	56' 0"	17.1	47/14.3	47/14.3	71/21.6	90/27.4	150/45.7
F/A-18E,F	44' 9"	13.6	60' 2"	18.3	51/15.5	51/15.5	71/21.6	90/27.4	150/45.7
S-3	68' 8"	20.9	53' 3"	16.2	51/15.5	51/15.5	114/34.7	99/30.2	150/45.7
C-5	222' 9"	67.9	247' 11"	74.9	199/60.6	199/60.6	350/107	273/83.2	150/45.7
C-9	93' 4"	28.4	119' 4"	36.4	97/29.6	97/29.6	160/48.8	133/40.5	150/45.7
C-17	170' 0"	51.8	174' 0"	53	-2	-2	-2	-2	150/45.7
C-141A	160' 0"	48.8	145' 0"	44.2	-2	-2	-2	-2	150/45.7
C-141B	160' 0"	48.8	168' 3"	51.3	-2	-2	-2	-2	150/45.7
C-40A									150/45.7
E-6	148' 0"	45.1	150' 0"	45.7	-2	-2	-2	-2	150/45.7
KC-135	130' 10"	39.9	136' 3"	41.5	130/39.6	130/39.6	220/67	181/55.2	150/45.7
T-2	38' 1"	11.6	38' 7"	11.8	40/12.2	40/12.2	90/27.4	90/27.4	150/45.7
T-39	44' 5"	13.6	44' 6"	13.6	38/11.6	38/11.6	90/27.4	90/27.4	150/45.7
T-45	30' 10"	9.4	39' 3"	12	-2	-2	-2	-2	150/45.7

Note: (1) Wing Swept  
(2) Contact COMNAVAIRSYSCOM for guidance

**Table 11320-2. Parking Apron Spacing - Jet Aircraft: 90 Degree Parking**

Aircraft Type	Wingspan		Length		A	B	C	D	E
	(ft/in)	(m)	(ft/in)	(m)	(ft/m)	(ft/m)	(ft/m)	(ft/m)	(ft/m)
A-4	27' 6"	8.38	39' 5"	12	39/11.9	28/8.5	38/11.6	125/38.1	150/45.7
A-6	53' 0"	16.1	54' 6"	16.6	56/17.1	53/16.1	68/20.7	105/32.0	150/45.7
A-7	40' 4"	12.3	56' 0"	17.1	46/14.0	39/11.9	49/14.9	125/38.1	150/45.7
AV-8	30' 4"	9.2	46' 4"	14.1	46/14.0	30/9.1	40/12.2	100/30.5	150/45.7
EA-6B	53' 0"	16.1	59' 10"	18.2	60/18.3	53/16.1	68/20.7	105/32.0	150/45.7
F-35B	35' 0"	10.7	51' 3"	15.6	45/13.7	45/13.7	65/19.8	200/61.0	150/45.7
F-35C	43' 0"	13.1	51' 4"	15.6	47/14.3	47/14.3	65/19.8	200/61.0	150/45.7
F-4	38' 5"	11.7	58' 3"	17.7	58/17.7	38/11.6	48/14.6	115/35.0	150/45.7
F-5E	28' 0"	8.5	48' 3"	14.6	48/14.6	28/8.5	38/11.6	100/30.5	150/45.7
F-5F	28' 0"	8.5	51' 8"	15.5	52/15.8	28/8.5	38/11.6	100/30.5	150/45.7
F-14	64' 2"	19.5	62' 8"	19.1	62/18.9	65/19.8	80/24.4	125/38.1	150/45.7
F-14(1)	38' 3"	11.7	62' 8"	19.1	62/18.9	65/19.8	80/24.4	125/38.1	150/45.7
F/A-18A,B,C,D	40' 5"	12.3	56' 0"	17.1	56/17.1	40/12.2	50/15.2	115/35.0	150/45.7
F/A-18E,F	44' 9"	13.6	60' 2"	18.3	60/18.3	45/13.7	50/15.2	115/35.0	150/45.7
S-3	68' 8"	20.9	53' 3"	16.2	53/16.1	69/21.0	84/25.6	135/38.1	150/45.7
C-5	222' 9"	67.9	247' 11"	74.9	247/75.0	223/68.0	248/75.6	273/83.2	150/45.7
C-9	93' 4"	28.4	119' 4"	36.4	119/36.3	93/28.3	113/34.4	133/40.5	150/45.7
C-17	170' 0"	51.8	174' 0"	53	174/53.0	170/51.8	190/57.9	210/64.0	150/45.7
C-141A	160' 0"	48.8	145' 0"	44.2	168/51.2	161/49.1	186/56.7	211/64.3	150/45.7
C-141B	160' 0"	48.8	168' 3"	51.3	168/51.2	161/49.1	186/56.7	211/64.3	150/45.7
C-40A									
E-6	148' 0"	45.1	150' 0"	45.7	150/45.7	148/45.1	168/51.2	190/57.9	150/45.7
KC-135	130' 10"	39.9	136' 3"	41.5	136/41.4	131/39.9	156/47.5	181/55.2	150/45.7
P-8A	124' 6"	37.9	129' 6"	39.5'	130/39.6	125/38.1	150/45.7	194/59.1	150/45.7
T-2	38' 1"	11.6	38' 7"	11.8	39/11.9	38/11.6	48/14.6	110/33.5	150/45.7
T-39	44' 5"	13.6	44' 6"	13.6	45/13.7	44/13.4	54/16.4	115/35.0	150/45.7
T-45	30' 10"	9.4	39' 3"	12	39/11.9	31/9.5	41/12.5	100/30.5	150/45.7

Note: (1) Wings Swept

**Table 11320-3. Parking Apron Spacing Propeller Aircraft: 90 Degree Parking**

Aircraft Type	Wingspan		Length		A	B	C	D	E
	(ft/in)	(m)	(ft/in)	(m)	(ft/m)	(ft/m)	(ft/m)	(ft/m)	(ft/m)
C-2	80' 7"	24.6	56' 8"	17.3	57/17.4	81/24.7	101/30.8	121/36.9	150/45.7
C-12	54' 6"	16.6	43' 9"	13.3	44/13.4	55/16.8	70/21.3	90/27.4	150/45.7
C-130	132' 7"	40.4	97' 10"	29.8	98/29.9	133/40.5	158/48.1	183/55.8	150/45.7
E-2	80' 7"	24.6	57' 6"	17.5	56/17.1	81/24.7	101/30.8	121/36.9	150/45.7
P-3	99' 8"	30.4	116' 10"	35.6	117/35.7	100/30.5	120/36.6	150/45.7	150/45.7
T-34	33' 4"	10.1	28' 9"	8.7	29/8.8	33/10.0	43/13.1	90/27.4	150/45.7
T-44	50' 3"	15.3	35' 6"	10.8	36/11.0	50/15.2	65/19.8	90/27.4	150/45.7

**Table 11320-4. Parking Apron Spacing Helicopters - 90 Degree Parking**

Aircraft Type	Wingspan		Length		A	B	C	D	E(1)
	(ft/in)	(m)	(ft/in)	(m)	(ft/m)	(ft/m)	(ft/m)	(ft/m)	(ft/m)
H-1, except AH-1	48' 0"	14.6	58' 4"	17.8	58' 4"/17.8	48'/14.6	72'/22	120'/36.6	92'/28
AH-1	48' 0"	14.6	58' 3"	17.8	58' 3"/17.8	48'/14.6	72'/22	120'/36.6	92'/28
H-2	44' 0"	13.4	52' 7"	16	52/15.8	44/13.4	66/20.1	110/33.5	86/26.2
H-3	62' 0"	18.9	72' 6"	22.1	73/22.2	62/18.9	93/28.3	124/37.7	113/34.4
H-46	51' 0"	15.5	84' 4"	25.7	84' 4"/25.7	51'/15.5	76' 6"/23.3	102'/31.1	96' 6"/29.4
H-53D	72' 3"	22	88' 3"	25.4	88/26.8	72/21.8	108/32.9	144/34.7	128/39.0
H-53E/K	79' 0"	24.1	99' 0"	30.2	99/30.2	79/24.1	119/36.3	158/48.1	139/42.4
TH-57	33' 4"	10.1	38' 10"	11.8	39/11.9	33/10.0	50/15.2	84/25.6	70/21.3
H-60	64' 10"	19.7	53' 8"	16.3	65/19.8	54/16.4	81/24.7	108/32.9	101/30.8
V-22	84' 6"	25.8	57' 8"	17.6	58'/17.7	85'/26	127'/38.7	170'/52	150'/45.7

Note: (1) The "E" dimension for helicopters is equal to 1.5 x (Rotor Diameter) plus 20 ft.  
Therefore, E = 1.5R + 20

Figure 11320- 1: 90 Degree Aircraft Configuration

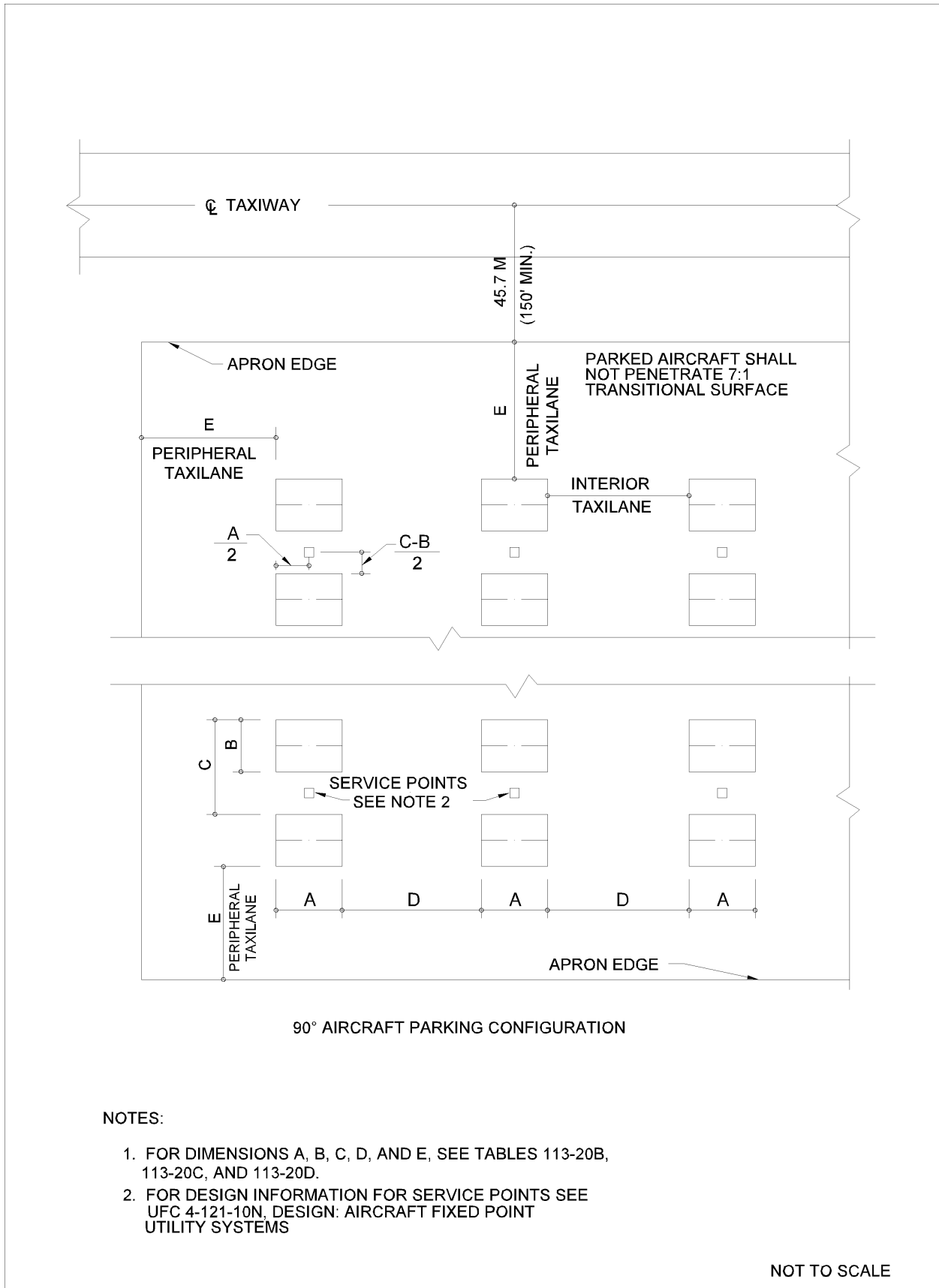
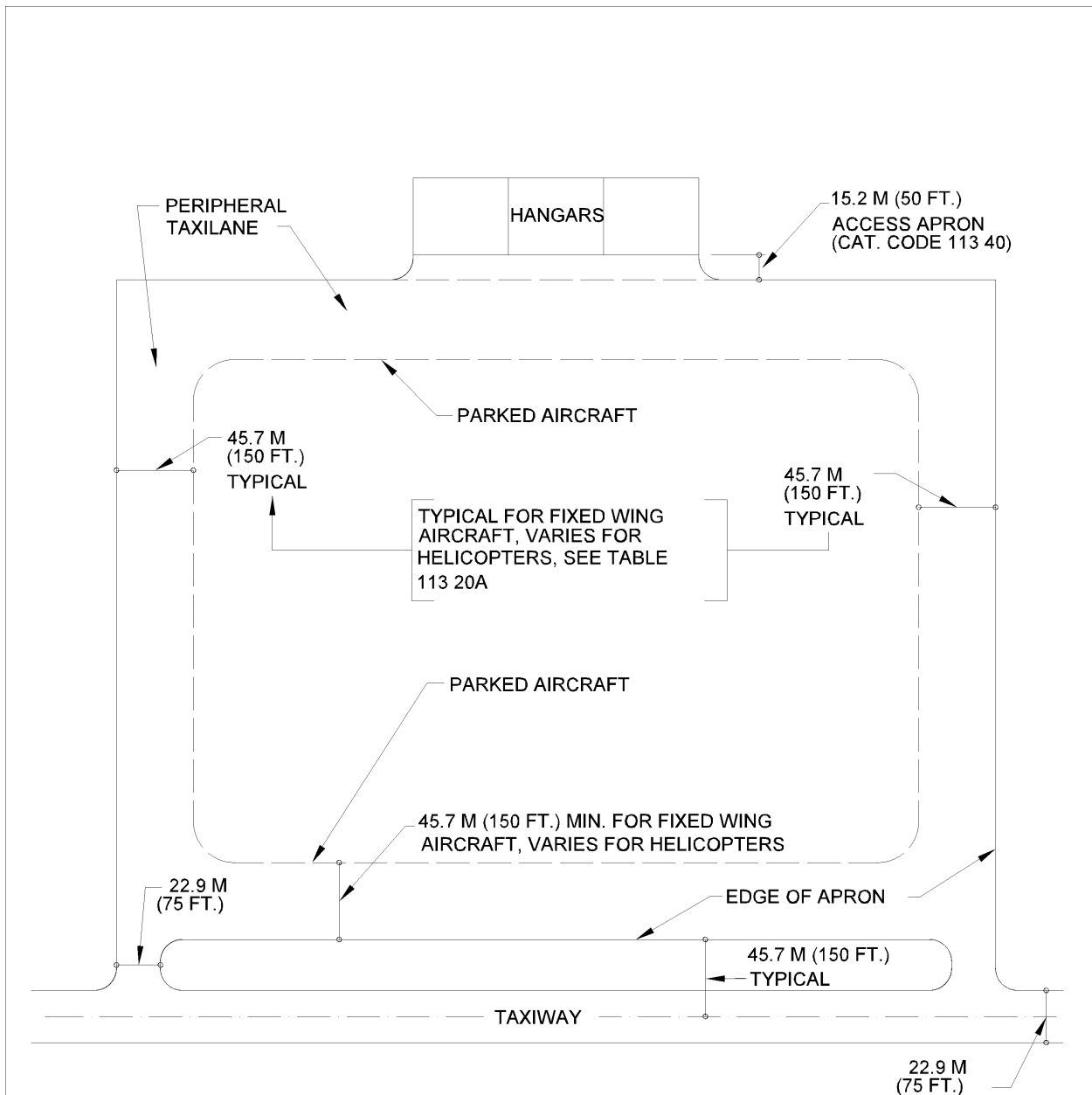




Figure 11320-3: Typical Aircraft Parking Apron



TYPICAL AIRCRAFT PARKING APRON

NOTES:

1. DIMENSIONS MARKED "TYPICAL" MAY BE REDUCED UNDER CERTAIN OPERATING CONDITIONS. SEE PARAGRAPH TITLED "DEVIATIONS FROM CRITERIA".
2. THE EDGE OF THE APRON MUST BE OUTSIDE THE RUNWAY PRIMARY SURFACE, PARKED AIRCRAFT SHALL NOT PENETRATE THE 7:1 TRANSITION SURFACE. (SEE UFC-3-260-01, AIRFIELD AND HELIPORT PLANNING AND DESIGN.)

NOT TO SCALE

Figure 11320-4: Aircraft Parking Apron, Fixed Wing Aircraft, Minimal Through Traffic

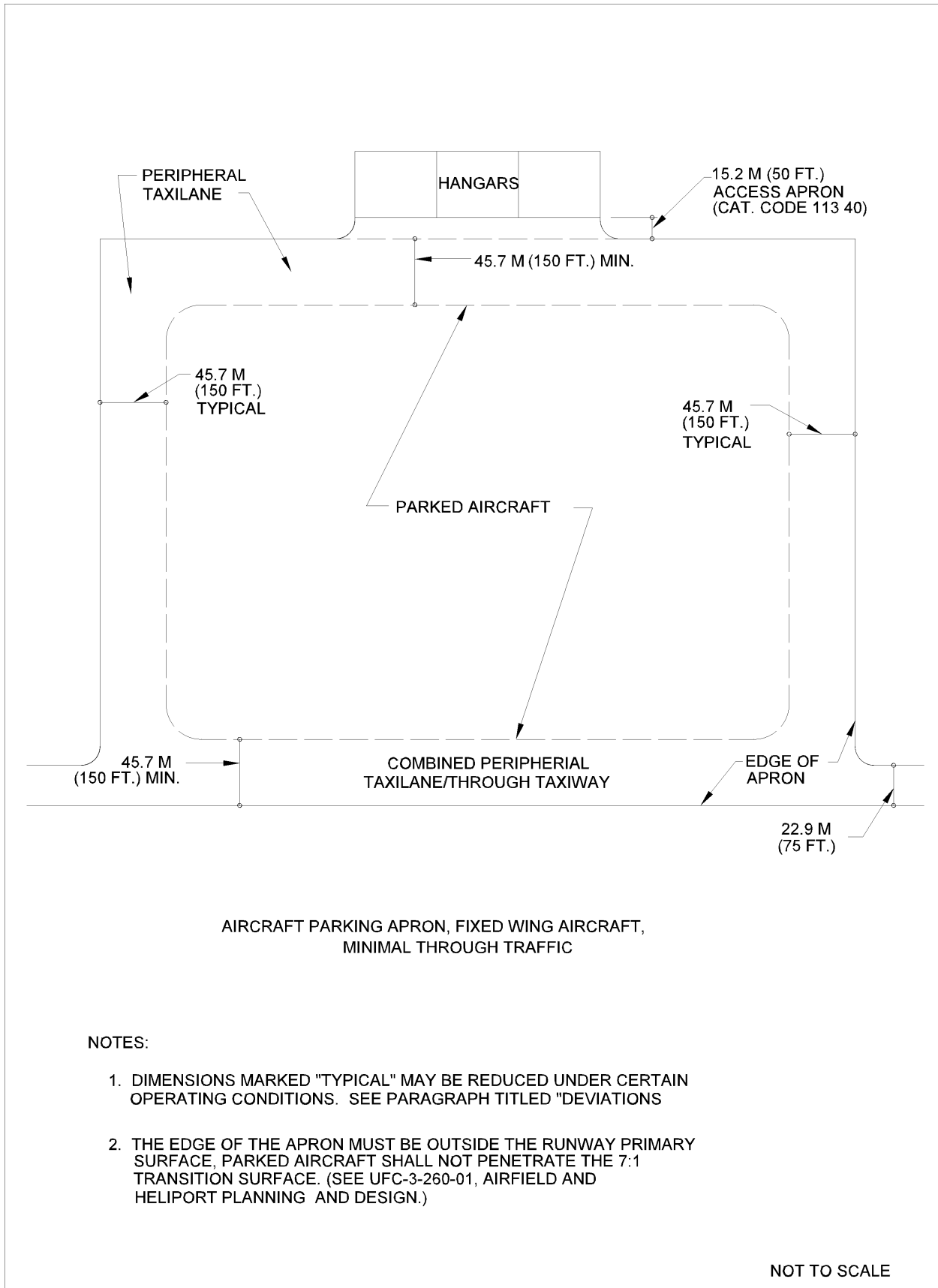
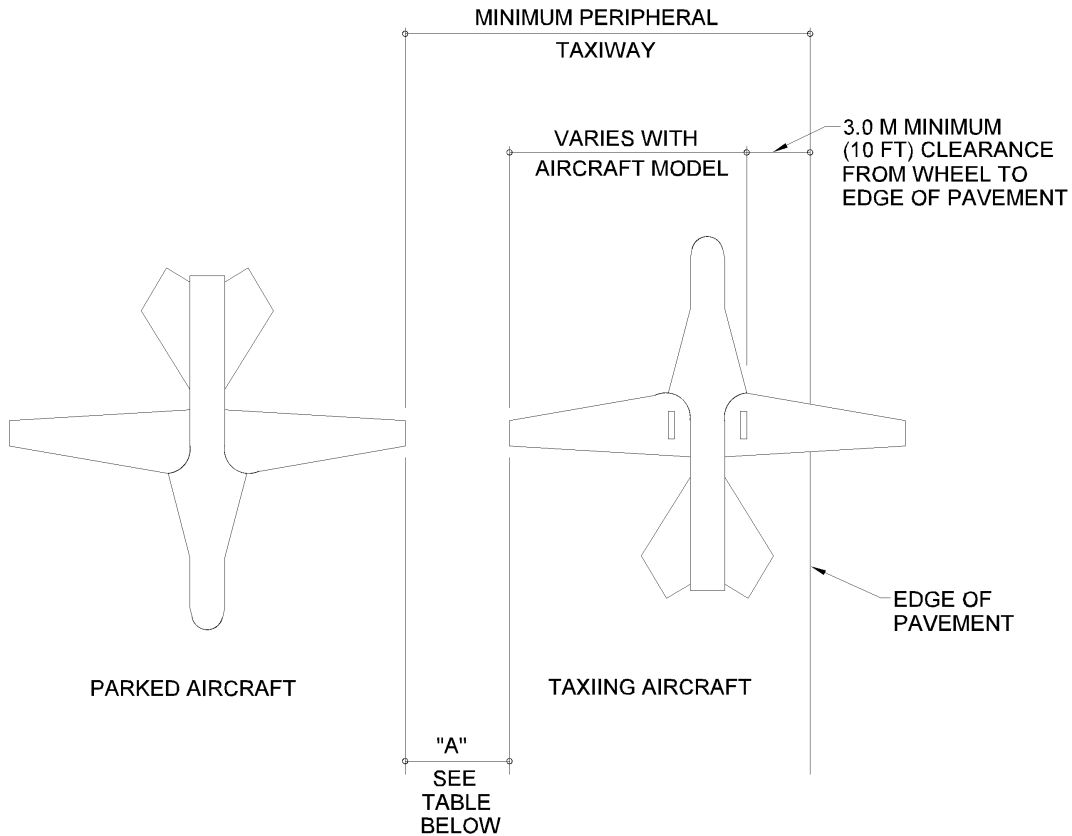


Figure 11320-5. Minimum Peripheral Taxiway, Fixed Wing Aircraft



MINIMUM PERIPHERAL TAXILANE, FIXED WING AIRCRAFT

WINGSPAN OF TAXIING AIRCRAFT	"A" MIN. WINGTIP CLEARANCE
OVER 30.5 M (100 FT.)	7.6 M (25 FT.)
22.9 M TO 30.5 M (75 FT. TO 100 FT.)	6.1 M (20 FT.)
15.2 M TO 22.5 M (50 FT. TO 74 FT.)	4.6 M (15 FT.)
15.2 M (LESS THAN 50 FT.)	3.0 M (10 FT.)

NOT TO SCALE



**113 40 AIRCRAFT ACCESS APRON (M2/SY)****FAC: 1131****BFR Required: Y****Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

**11340-1 AIRCRAFT ACCESS APRONS.** Aircraft access aprons provide access to aircraft maintenance hangars from the aircraft parking apron and is normally programmed at the same time as the hangar (Category Code 211 05). The paved area required varies with the hangar dimensions and the hangars displacement from the aircraft parking apron. The access apron requires a minimum 15.2 meter (50 foot) depth and must be at least as long as the hangar door.

**116 AIRCRAFT PAVEMENTS – OTHER**

**116-1 DESCRIPTION.** Included in this basic category are airfield pavements, other than runways, taxiways, and aprons, such as wash racks, rinse facilities, compass calibration pads, arming/de-arming pads, Ground Controlled Approach (GCA) pads, blast protective pavement, line vehicle parking, tow ways, ordnance handling pads, fire and rescue vehicle alert pads, and tactical support van pads.

**116 10 AIRCRAFT WASHRACK PAVEMENT (M2/SY)****FAC: 1163****BFR Required: Y****Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

**11610-1 WASHRACKS.** Aircraft wash racks are provided at all air installations for cleaning of aircraft in conjunction with periodic maintenance. See Category Code 116 15 for aircraft freshwater rinse facility criteria. A minimum of one wash rack is required at each Naval and Marine Corps aviation shore installation. The total number required at an installation depends on numbers and types of on-board aircraft. The number of aircraft that can be serviced by a single wash rack is dependent on the frequency of required washes, prescribed in NAVAIR Manual NA01-1A-509, the average time to wash the aircraft, and the availability of the wash rack. The two types of standard wash racks are:

**11610-1.1 Type A (for Fighter and Attack Aircraft and Helicopters):**

For Navy and Marine Corps Aircraft, (except H-53) 671 square meters (25.9 m x 25.9 m) (803 square yards (85 ft x 85 ft)). H-53 aircraft require 1,116 square meter (30.5 m x 36.6 m) (1,333 square yard (100 ft x 120 ft)).

**11610-1.2** Type A wash rack can service 80 VAVF or similar size aircraft or 40 rotary wing aircraft, or a combination of both. The number of combined aircraft that can be serviced on a Type A pad can be determined from the following

equation: The number of VA/VF (or similar size) aircraft plus two times the number of helicopters equals 80.

*Example: 40 VA/VF plus 20 helicopters as 40 plus 2(20) does not exceed 80.*

**11610-1.3 Type B (for Patrol and Cargo Transport Aircraft):**

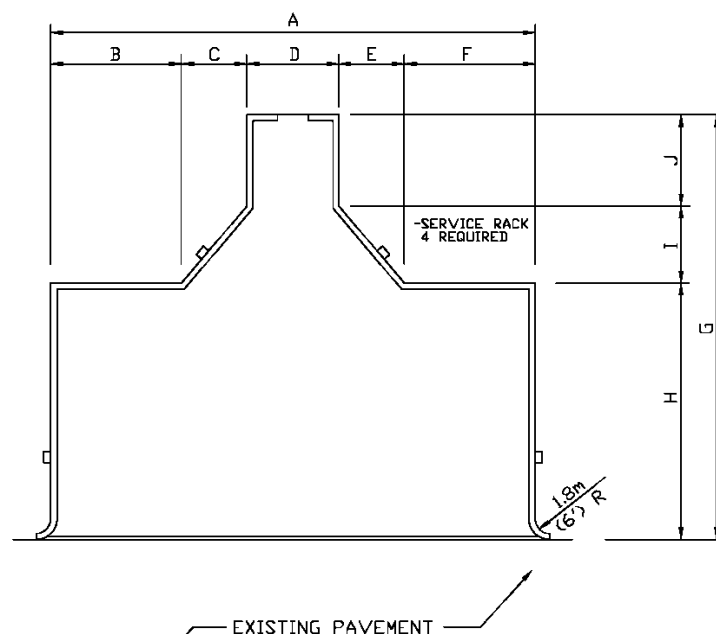
For Navy and Marine Corps aircraft (except E-6) 1,522 square meters (1,822 square yards). E-6 aircraft require 3,173 square meters (3,797 square yards). See Figure 116-10A for typical configuration and dimensions.

**11610-1.4** Type B washrack can service 20 VP aircraft or 80 cargo transport aircraft, or a combination of both. The number of combined aircraft that can be serviced on a Type B pad can be determined from the following equation: four times the number of patrol aircraft (VP) plus the number of cargo aircraft equals 80.

*EXAMPLE: 18 VP and 8 cargo as 4(18) plus 8 does not exceed 80.*

**Figure 11610-1: Type B Wash Rack**

DIMENSION	ALL NAVY AIRCRAFT EXCEPT E-6	E-6 AIRCRAFT
A	42.7m (140')	61.0m (200')
B	9.2m (30')	10.7m (35')
C	6.1m (20')	4.9m (16')
D	12.2m (40')	29.9m (98')
E	6.1m (20')	10.7m (35')
F	9.1m (30')	4.9m (16')
G	45.8m (150')	57.9m (190')
H	30.5m (100')	45.8m (150')
I	6.1m (20')	4.9m (16')
J	9.2m (30')	7.3m (24')



**11610-2 WASH RACK LOCATION.** The normal location of the wash racks is adjacent to the hangar with access pavement provided as required. Utilities and an antipollution drainage system are provided.

**11610-3 ACCOMPANYING UTILITIES.** A utilities control building with a gross area of approximately 58.6 square meters (630 square feet) is planned with each wash rack. It houses detergent metering equipment, air compressor, detergent mixing tank, water heater, utility controls, sanitary facilities for personnel, if required, and storage space for cleaning equipment. A detergent storage tank is located outside of the utilities control center and may be below ground.

**11610-4 SAFE ACCESS.** An aircraft wash rack must include the capability to provide safe access to all aircraft surfaces with lifelines and/or platforms for personnel safety.

**11610-5 RUNOFF.** In addition, the wash rack pavement must be curbed and guttered to preclude uncontrolled runoff of wash and rinse water. The wash rack pavement must also include adequate runoff storage capacity to preclude overflow of wash and rinse water and average daily rainfall with daily emptying and disposal of effluent in the sump. For VF/VA and helicopter type aircraft this effluent storage capacity shall be not less than 18,900 L (5,000 GA) per day. For VP and transport type aircraft the effluent collection and storage capacity shall be not less than 15,100 L (4,000 GA) per day. For layout and design criteria for wash racks, see UFC 3-260-01.

## **116 12 AIRCRAFT PAVEMENT SHOULDER (M2/SY)**

**FAC: 1165**

**BFR Required: Y**

**11612-1 DESCRIPTION.** No criteria are currently available for this category code.

## **116 15 AIRCRAFT RINSE FACILITY (M2/SY)**

**FAC: 1167**

**BFR Required: Y**

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design  
**Planning Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

**11615-1 TAXI-THROUGH.** An aircraft rinse facility provides an unattended taxi-through, treadle operated, freshwater deluge system to rinse aircraft. The aircraft rinse facility is required at each Navy and Marine Corps air installation having aircraft subject to accelerated corrosion due to low-level over-water operations or a corrosive atmosphere at the installation. A facility of appropriate type is planned for each type of aircraft normally stationed at the airfield.

**11615-1.1** Type 1 is for rotary wing aircraft and has a gross area of 913.3 M2 (1,093 SY)

- 11615-1.2** Type 2 is for VP type aircraft and has a gross area of 1428.9 M2 (1,710 SY)
- 11615-1.3** Type 3 is for VF or VA type aircraft and has a gross area of 760.4 M2 (910 SY)
- 11615-1.4** Type 4 is for V-22 aircraft and has a gross area of 913.3 M2 (1,093 SY)

**11615-2 ACCESS TAXIWAYS AND VEHICLE ROADS.** Access taxiways (Category Code 112 10) and vehicle roads (Category Code 851 10) are programmed with the rinse facility as required. The facility should be located in proximity to the most frequently used taxiway and as near to the hangar area as possible. A water supply and drainage area are required.

## **116 20 AIRCRAFT COMPASS CALIBRATION PAD (M2/SY)**

**FAC: 1161**

**BFR Required: Y**

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design; Military Handbook 1021/1, Airfield Geometric Design

**Planning Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

**11620-1 AIRCRAFT COMPASS CALIBRATION PAD.** An aircraft compass calibration pad is a paved area in a magnetically quiet zone where the compass in the aircraft is calibrated. There are two types of calibration pads:

- a. Type I is used with the magnetic compass calibration set.
- b. Type II pad includes a compass rose and turntable and may be used either with or without the compass calibration set.

**11620-2 PAD CAPABILITIES.** Either pad handles one aircraft at a time. A minimum of one pad is provided at each station, however, additional pads may be required based on local demand. The time required to calibrate one aircraft compass using the magnetic compass calibration set is 2 hours. When using a Type II compass calibration pad without the magnetic compass calibration set, approximately 1 hour is required.

**11620-3 SITING.** Existing paved areas located where earth's magnetic field is uniform are suitable for use as compass calibration pads. New Type II pads with compass rose and turntable are planned only where required for aircraft not adaptable to the magnetic compass calibration set.

**11620-4 MINIMUM DISTANCES.** Minimum distances from potential magnetic interference structures to the center of the pad are: 84 meters (275 feet) to the centerline of the nearest taxiway or towway; 69 meters (225 feet) to underground metal conduits and piping; 84 meters (275 feet) to the edge of aircraft and vehicle parking areas; 152 meters (500 feet) to underground powerline; 183 meters (600 feet) to overhead steam lines, a.c. power lines and/or equipment, nearest edge of railroad

tracks, nearest portion of building containing any magnetic material; 305 meters (1,000 feet) to d.c. power lines and/or equipment.

**11620-5 ACCESS TAXIWAY TO CALIBRATION PAD.** The access taxiway to the calibration pad is oriented to facilitate moving the aircraft onto the pad, headed toward magnetic north. Each pad requires a target placed at a known but arbitrary bearing at a distance of approximately 805 meters (one-half mile) from the pad and visible from both the aircraft and the compass calibration set.

**11620-6 GROSS AREA REQUIRED FOR CALIBRATION PAD.** The gross area required for a compass calibration pad exclusive of access taxiway is 1,340 M<sup>2</sup> (36.6 m by 36.6 m) (1,600 square yards (120 ft by 120 ft)).

### **116 35 ARMING AND DE-ARMING PAD (M<sup>2</sup>/SY)**

**FAC: 1131**

**BFR Required: Y**

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design; Military Handbook 1021/1, Airfield Geometric Design

**Planning Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design; NAVSEA OP-5 – Volume I, latest revision, Ammunition Ashore Regulations for Handling, Storing, Production, Renovation and Shipping

**11635-1 DESCRIPTION.** This pad provides a paved area for activating or deactivating weapons systems on-board aircraft. It is utilized at all Navy and Marine Corps air installations where gunnery, rocketry, and/or missile firing are conducted. The average time for arming an aircraft is 20 minutes, and for de-arming an aircraft, 30 minutes. All aircraft on the pad may be either armed or de-armed simultaneously; however, arming and de-arming cannot occur simultaneously on the same pad. The number of pads at an installation depends upon the demand at that installation. The pads are sited at either end of the primary runway and, if additional pads are required, at either end of the crosswind runways.

**11635-1.1 Type A.** The gross area of the Type A pad (exclusive of the access taxiway) is 2,138 square meters (30.5 meters by 70.1 meters) (2,556 square yards (100 feet by 230 feet). The Type A pad will accommodate simultaneously four helicopters (AH-1 type).

**11635-1.2 Type B.** The gross area of the Type B pad (exclusive of the access taxiway) is 5,434 square meters (45.7 meters by 118.9 meters) (6,500 square yards (150 feet by 390 feet). The Type B pad will accommodate simultaneously four fixed wing attack (VA) aircraft or four fixed wing fighter (VF) aircraft.

**11635-1.3 Type C.** The gross area of the Type C pad (exclusive of the access taxiway) is 6,526 square meters (79.3 meters by 82.3 meters) (7,800 square yards (260 feet by 270 feet). The Type C pad will accommodate simultaneously two fixed wing patrol (VP) aircraft.

**11635-2 PARKING AT PAD.** Aircraft utilizing the pad normally park parallel to the runway but in any case they park headed in the direction providing the maximum length of undeveloped space along the extended longitudinal centerline of the aircraft. In no case is arming or de-arming of propelled armament conducted when the aircraft is headed towards inhabited areas on or near the air installation.

**116 40 PRECISION APPROACH RADAR (PAR) PAD (M2/SY)**

**FAC: 1164**

**BFR Required: N**

**Design Criteria:** Military Handbook 1024/1, Aviation Operational and Support Facilities; Technical Manuals for Specified Equipment

**11640-1 PAR PAD.** The Precision Approach Radar (PAR) pad is a paved hardstand provided to support the PAR equipment in operating position. The hardstand must be a minimum of 146 square meters (12.1 meters by 12.1 meters) (178 SY (40 feet by 40 feet)). Technical manuals provided by the equipment manufacturers should also be consulted in order to determine the most appropriately sized pad. The number of pads required depends on the number of PAR units at the air installation. At installations where PAR approaches are provided to more than one runway by a single PAR unit, a turntable is provided to allow PAR service to more than one runway. Technical manuals for the respective equipment describe acceptable locations for the pad.

**116 41 PRECISION APPROACH RADAR (PAR) PAD (M2/SY)**

**FAC: 1164**

**BFR Required: N**

**11640-1 DESCRIPTION.** A paved hardstand pad that provides support to the Improved Fresnel Lens Optical Landing System (IFLOLS) equipment in operating position.

**116 42 BLAST PROTECTIVE PAVEMENT (M2/SY)**

**FAC: 1164**

**BFR Required: N**

**Design Criteria:** Military Handbook 1021/1, Airfield Geometric Design

**11642-1 DESCRIPTION.** Blast protective pavement is provided adjacent to the runway threshold and end turnoff for all runways except those at basic training propeller aircraft fields. However, in cases where the training propeller aircraft is not an exclusive use to the airfield, blast protective pavement is a requirement. Permanently based aircraft and significant transient aircraft and services should be included in determining a requirement for pavement protection. Blast protective pavement may be required in other locations for aircraft, such as the F/A-18 with downward exhausted auxiliary power units, the AV-8B with ducted exhaust, and the V-22 with both down turbine exhaust and propeller wash. The area of blast protective pavement required for a particular aircraft

may be determined from exhaust plume data in Naval Air Training and Operating Procedures Standardization (NATOPS) or engine manufacturers specifications for developmental aircraft. For aircraft including F/A-18, AV-8B, and V-22 the width of the blast protective pavement is 30.5 meters (100 feet) except for Master Jet Air Stations where the width shall be 37.5 meters (125 feet).

**116 45 LINE VEHICLE PARKING (M2/SY)**

**FAC: 1164**

**BFR Required: N**

**Design Criteria:** Military Handbook 1021/1, Airfield Geometric Design; NAVAIR 00-80T-109

**11645-1 VEHICLE PARKING SPACES.** Line vehicle parking spaces contiguous to taxiway and parking aprons are allocated for ground support equipment assigned for flight line use. See Table 11645-1 for space requirements.

**Table 11645.1. Line Vehicle Parking**

<b>Equipment</b>	<b>Area (M2)</b>	<b>Area (SY)</b>
Tow Tractor	16.7	20
Refueling Truck (1)	39.3	47
Refueling Trailer (1)	58.5	70
Mobile Electric Power Plant	10	12
Nitrogen/Oxygen Trailer	6.7	8
Air Conditioning Trailer	10	12
Utility Vehicle	16.7	20
Bomb Truck	16.7	20
Bomb Trailer	12	14
Industrial Flatbed Truck	7.5	9
Industrial Platform Truck	7.5	9

Note: (1) Parking for both truck and trailer refuelers should be sited away from the flightline to reduce and/or eliminate hazards. NAVAIR 00-80T-109 states that refuelers and fuel servicing equipment will be parked in designated areas which have a minimum lateral separation of 7.6 meters (25 feet), measured center to center of truck, between trucks. It also states that no refuelers and fuel servicing equipment will be parked closer than 30.5 meters (100 feet) to any inhabited building.

**11645-2 PARKING FOR FIRE AND RESCUE VEHICLES.** Parking for aircraft fire and rescue vehicles are provided separately. See Category Code 141 20, Aircraft Fire and Rescue Station and Category Code 116 60, Fire and Rescue Vehicle Alert Pad.

**11645-3 OPTIMUM EFFICIENCY.** Parking areas shall be selected to permit optimum efficiency in the use of equipment (for example, squadron vehicles will normally be assigned space close to the squadron maintenance hangar) and to conform to lateral safety clearances for existing and projected airfield pavements. Where weather requires and the clearances permit, shelter for line vehicles may be provided.

**116 50 TOWWAY (M2/SY)**

**FAC: 1131**

**BFR Required: N**

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design; Military Handbook 1021/1, Airfield Geometric Design

**Planning Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

**11650-1 DESCRIPTION.** A tow way is a paved roadway used for towing fixed or rotary wing aircraft from one area to another. It differs from a taxiway in that aircraft do not move on it under their own power. Tow ways may be authorized at air installations where it is necessary to tow aircraft from one operational area to another and in some instances, particularly at air installations with jet aircraft, to minimize noise conditions. Tow way pavement is normally provided at industrial seaport air installations where carrier berthing facilities include those for unloading and loading of aircraft. Pavement marking, particularly centerline, should be provided, and lighting provided if operations are to be conducted at night.

**11650-2 TOWWAYS ON EXISTING STREETS AND ROADS.** In some cases, towways will be on existing streets and roads or abandoned runways and taxiways, which may be tailored for this use. Such modification will include reconstruction or strengthening of existing facilities to support the maximum aircraft loading that will be superimposed at each location, as well as provision for adequate horizontal and vertical clearances. Jet blast criteria and shoulder specification need not be considered.

**11650-3 TYPICAL TOWWAY WIDTHS.** Tow ways are planned for air installations based upon the installation mission and type aircraft to be moved. Typical tow way widths are 10.7 meters (35 feet) to support Navy and Marine Corps rotary wing aircraft, 11.0 meters (36 feet) to support Navy and Marine Corps fixed wing carrier-based aircraft, and 12.2 meters (40 feet) to support Navy and Marine Corps Patrol and Transport aircraft.

**116 55 ORDNANCE HANDLING PAD (M2/SY)**

**FAC: 1131**

**BFR Required: Y**

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design; Military Handbook 1021/1, Airfield Geometric Design

**Planning Criteria:** NAVFAC P-80.3, Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations; Appendix E, Airfield Safety Clearances, UFC 3-260-01, Airfield and Heliport Planning and Design; ; NAVSEA OP-5 – Volume I, latest revision, Ammunition Ashore Regulations for Handling, Storing, Production, Renovation and Shipping



**11655-1 DESCRIPTION.** An ordnance handling pad is provided for air installations where there is a requirement for loading or off-loading explosives from cargo aircraft and where no apron is available for use without violating explosive safety distance criteria. The pads are designed for use by cargo aircraft and will generally vary in size depending on the type of ordnance being handled and the number and type of aircraft to be loaded/unloaded simultaneously.

**11655-1.1 Types of Pads:**

- a. Circular: At aviation facilities used by small cargo aircraft, the Ordnance Handling Pad is a circular pad as shown in Figure 11655-1
- b. Semi-Circular: At aviation facilities used by large cargo aircraft and Aerial Ports of Embarkation (APOE) and Aerial Ports of Debarcation (APOD), the Ordnance Handling Pad is a semi-circular pad as shown in Figure 11655-2. The semi-circular pad is adequate for aircraft up to and including the dimensions of a C-5 aircraft.

**11655-1.2 Dimensions.** The Ordnance Handling Pad geometric dimensions shown in Figures 11655-1 and 11655-2 are minimum requirements. Ordnance Handling Pads may be larger than these if the design aircraft cannot maneuver on the pad.

**Figure 11655-1. Ordnance Handling Pad Other Than APOE/Ds**

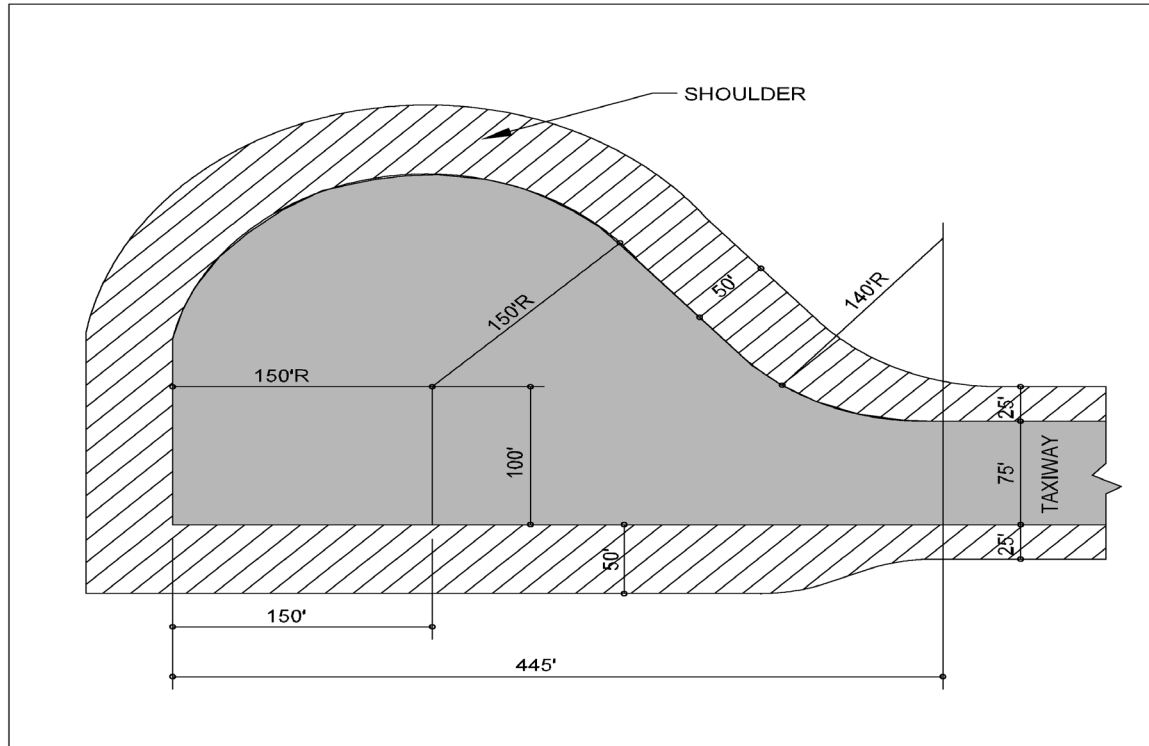
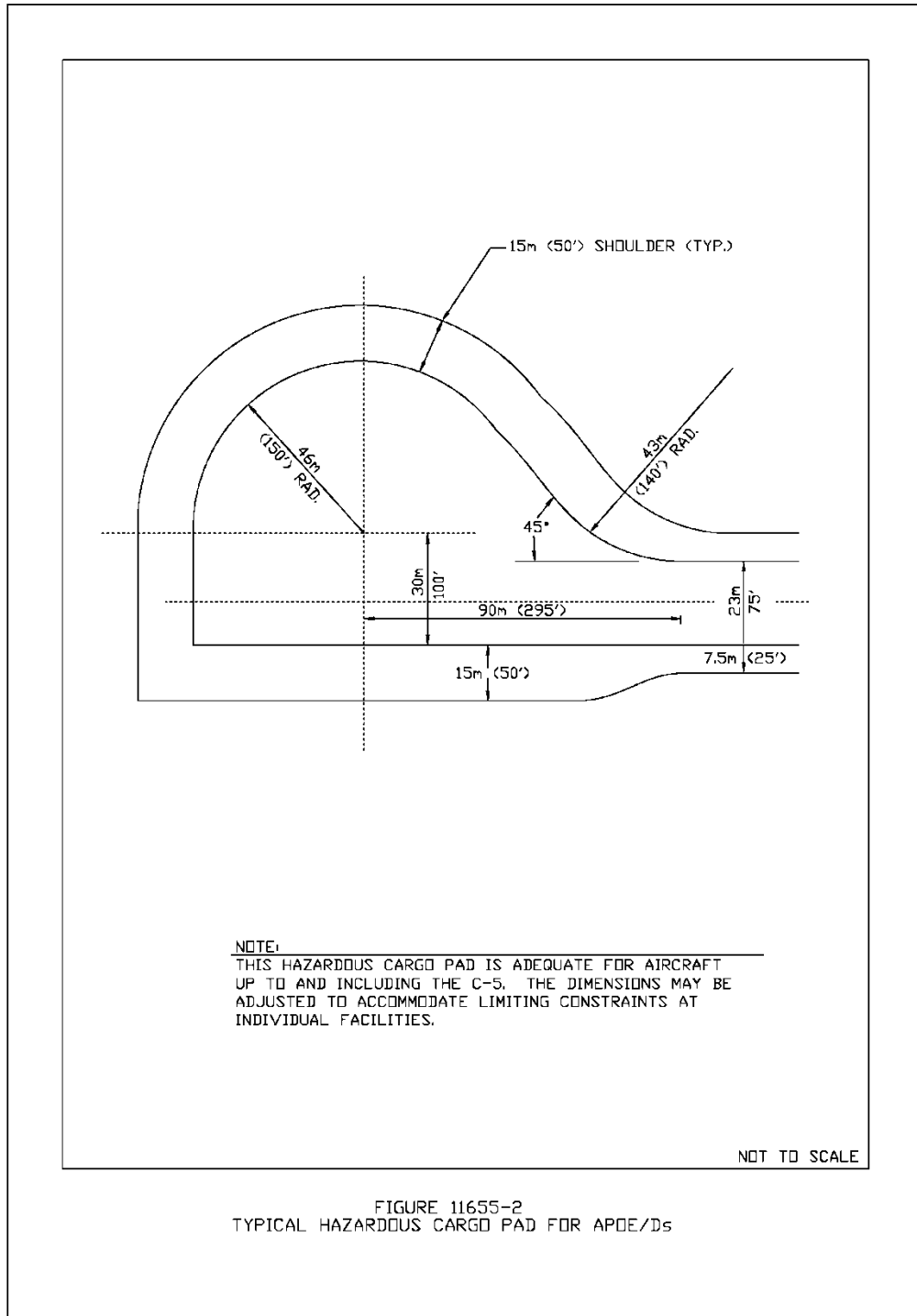


Figure 11655-2. Ordnance Handling Pad for APOE/Ds



**11655-2      **ORDNANCE HANDLING PAD SITING.**** The ordnance handling pad shall be sited in accordance with standards published in NAVSEA OP-5 - Volume I, latest revision (Ammunition Ashore Regulations for Handling, Storing, Production, Renovation and Shipping). Also, the ordnance pad should be sited in accordance with all pertinent airfield safety criteria. Barricades shall be provided where required by explosives safety criteria or where installation will produce a net reduction in construction and land acquisition costs.

**11655-3      **JOINT USE CONSIDERATION.**** Consideration should be given to a joint use Combat Aircraft Loading Area (CALA), Category Code 116-56, for ordnance handling provided the CALA is sited in accordance with the guidelines stated above.

**116 56      **COMBAT AIRCRAFT LOADING AREA (CALA) (M2/SY)****

**FAC: 1131**

**BFR Required: Y**

**Design Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

**Planning Criteria:** NAVFAC P-80.3, Facility Planning Factor Criteria for navy and Marine Corps Shore Installations; Appendix E, Airfield Safety Clearances, UFC 3-260-01, Airfield and Heliport Planning and Design; ; NAVSEA OP-5 – Volume I, latest revision, Ammunition Ashore Regulations for Handling, Storing, Production, Renovation and Shipping

**11656-1      **DESCRIPTION.**** The combat aircraft ordnance loading area is primarily an apron where explosives are loaded/off-loaded from combat aircraft departing and/or returning from weapons training flights. This area is required where there is not space available on the parking apron for loading mass detonating ordnance which will meet the explosive safety requirements specified in NAVSEA OP-5, Volume I, latest revision (Ammunition and Explosives Safety Ashore Regulations for Handling, Storing, Production, Renovation and Shipping). The weapons are not armed on this apron, see Category Code 116-35, Arming and De-arming Pad.

**11656-2      **COMPLIANCE WITH EXPOSIVE SAFETY CRITERIA.**** Due to the ordnance handling taking place on this apron, its location with respect to other facilities shall be determined using explosives safety criteria specified in NAVSEA OP-5, Volume I, latest revision. In addition, the airfield safety criteria specified in NAVFAC P-80.3,

**11656-3      Airfield Safety Clearances apply and:**

- a. The apron must be outside of the runway primary surface
- b. Parked aircraft shall not penetrate any transitional surface
- c. No objects shall be sited within 30.5 meters (100 feet) of the edge of this apron

**11656-4      **CRITERIA.**** There is no standard size for a combat aircraft ordnance loading area. The area required is a function of the number of aircraft to be simultaneously loaded/unloaded and the class and net explosive weight of the ordnance to be carried by each aircraft. Aircraft on the apron shall be separated from each other by the above ground magazine (unbarricaded, K=11) distances specified in OP-5, Volume I, latest revision. The greater the net explosive weight on the aircraft, the

greater the required separation. However, as a minimum, the aircraft spaces shall be separated by not less than the A, B, C, and D dimensions specified for parking aprons, Category Code 113 20. Peripheral taxi lanes shall be provided as required to provide safe access to parking spaces. For aircraft with less than 21.3 meter (70 foot) wingspan, a 22.9 meter (75 foot) wide peripheral taxi lane will provide sufficient wingtip clearance for a single aircraft to taxi past parked aircraft (assumes a 3.05 meter (10 foot) clearance between outermost tire of the taxiing aircraft and the edge of pavement). For aircraft with a wingspan of 21.3 meters (70 feet) or greater, the peripheral taxi lane width shall be determined using the clearance criteria shown in Figure 11320-5, Category Code 113 20. The minimum peripheral taxi lane width shall be 22.9 meters (75 feet).

**11656-5 SIZING FOR LOADING SCENERIOS.** The apron most likely will have to be sized to accommodate several loading situations. For example, parking locations could be spaced such that twelve aircraft could each be loaded with 227 kgs (500 lbs) net explosive weight or six aircraft, parked in alternate spaces, could each be loaded with 2,270 kgs (5,000 lbs) net explosive weight. The maximum net explosive weight to be on the apron at one time shall be used in determining the explosive quantity distance arcs for the apron. These arcs shall be measured from the edge of the apron pavement, including the peripheral taxi lanes. Justification shall be provided for the number of aircraft and the net explosive weight per aircraft chosen for sizing the apron. Strong consideration shall be given to providing a joint use apron for ordnance handling from cargo aircraft, Category Code 116-55, and the combat aircraft ordnance area if these operations can be scheduled on a non-concurrent basis. If supporting facilities such as an ordnance operations building, or fixed point utility system are required, they shall be individually justified.

## **116 60 FIRE AND RESCUE VEHICLE ALERT PAD (M2/SY)**

**FAC: 1164**

**BFR Required: N**

**Design Criteria:** NAVAIR 00-80R-14, Aircraft Firefighting and Rescue NATOPS Manual

**Planning Criteria:** NAVFAC P-80.3, Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations; Appendix E, Airfield Safety Clearances

**11660-1 DESCRIPTION.** This facility provides parking area for Immediate Response Alert Vehicle. The purpose of the Immediate Response Alert is to:

1. Observe all landings and take-offs.
2. Respond immediately to any aircraft accident.
3. Provide timely rescue of personnel involved in emergencies.

**11660-2 SIZE AND LOCATION.** The pad should be large enough to park one 3,780 liter (1,000 gallon) aircraft rescue and fire fighting vehicle (P-19) and should be located no closer than 45.7 meters (150 feet) from the runway edge. The pad should not include a protective shelter or any other structure, which would violate airfield safety clearance criteria. See NAVFAC P-80.3 for guidance. The pad should be connected to the runway by a 4.9 meter (16 foot) wide access road to the runway. If there is no

access from the crash house to the alert pad other than from the runway, the parking space should be widened as required to allow the truck sufficient space to turn around (see Table 11660-1).

**Table 11660-1. 3,780 Liter (1,000 Gallon) Aircraft Rescue and Fire Fighting Vehicle Dimensions (P-19)**

Weight = 15,200 kg (3,600 lbs)
Width = 2.4 meters (8 feet)
Length = 8.3 meters (27.1 feet) (over bumpers)
Inside turning radius ("wall to wall") = 24.4 meters (80 feet)

**11660-3 MULTIPLE ALERT PADS.** Normally there will be one alert pad per air station. However, multiple alert pads will be required when more than one runway is in use and operations cannot be observed from a single vantage point. The optimum location is on either side of the runway and near the middle of the airfield, but may vary depending upon the best observation of the runway. Consideration should be given to maximum utilization of existing abandoned pavements prior to construction of an alert pad.

**11660-4 ELECTRICAL POWER JUSTIFICATION.** Normally electrical power is not provided to the Alert Pad. However, when power is required to charge the truck batteries, requirements must be individually justified. For additional information see NAVAIR 00-80R-14 Aircraft Firefighting and Rescue NATOPS Manual.

**116 65 TACTICAL SUPPORT VAN PAD (M2/SY)**

**FAC: 1164**

**BFR Required: Y**

**Planning Criteria:** NAVAIRINST 13670.1B

**11665-1 DESCRIPTION.** This facility consists of a concrete pad and support structure to accommodate groups of relocatable tactical shelters or "vans". Numerous functions at Navy and Marine Corps installations are done in relocatable shelters. These shelters, while referred to by different nomenclatures depending on usage, are commonly called "vans". They are generally aluminum structures built to commercial standards of 2.4 meters (8 feet) in width and height, and 6.1 meters (20 feet) in length. These vans can be carried by any military or commercial cargo carrier by air, ship, truck, or rail. Vans are designed to be grouped together with removable doors, access panels, and butting kits and can be configured for solo use or grouped in large complexes.

**11665-2 TYPES OF VANS:**

**11665-2.1 Interconnect Unit (INU).** Placed in the center of groups and used to connect vans of the other types together. INUs have a door at each end and three access panels on the sides for the joining of up to five vans to each INU.

**11665-2.2 Basic.** Internally configured for a specific mission from administrative to maintenance. These vans can be joined only with another van at each end.

**11665-2.3 Other (Right, Left, Middle).** These type of vans are used in specific configurations to make up double and triple wide vans. These vans can only be joined to a complex at the end of another basic van.

**11665-3 MAXIMUM VAN GROUP SIZE.** By NAVAIR Instruction, van groups cannot be larger than six INUs connected end to end with a maximum of two vans extending from each side. In this configuration, up to 42 vans can be joined together.

**11665-4 EXAMPLES OF VAN COMPLEXES:** By combining groups of 42 vans into larger complexes with other temporary structures, an entire Marine Aviation Logistics Squadron (MALS) can set up and operate from an unimproved forward deployed site. By far the largest user of vans is the MALS. Referred to as Mobile Maintenance Facilities (MMF), these vans are deployed in large complexes with the Marine Air group (MAG) to support various missions. Navy activities also use MMFs, primarily for P-3 deployable sites where Intermediate level support does not exist. Other units that utilize vans for tactical shelters when deployed are Mobile Calibration Laboratories (MCC), Marine Wing Support Squadrons (MWSS), Marine Wing Control Squadrons (MWCS), Marine Air Support Squadrons (MASS), and Marine Air Control Squadrons (MACS). When not forward deployed, these vans are used in various roles. Most MALS units utilize a large part of their vans to provide intermediate level maintenance support to home based squadrons, just as they would if they were deployed. Most other units use their vans for training.

**11665-5 REQUIREMENT:** All vans require a concrete pad and utility support when at home base. This allows the vans to be used, maintained, and always ready to deploy for their primary mission. This structure consists of two parts, the pad and a nearby support building.

**11665-6 PAD SIZE REQUIREMENTS.** Pads are built to accommodate the unit and van configuration of a specific mission. They are sized to hold the required quantity of vans established by the holding unit to accomplish the specific mission. The following guidance shall be used to size pads:

- a. For groups of up to 42 vans, establish the quantity and layout with the unit. Provide a pad sized to fit the required layout with a 0.152 meter (2 foot border)
- b. For groups of 42 vans, provide a 1,120 M2 (1,333 SY) pad.

- c. For groups of more than 42 vans, divide the quantity by 42 and multiply number of areas by 1,120 M2 (1,333 SY) and add a 4.6 meter (15 foot) access lane between areas. Add 93 M2 (111 SY) for storage of bogie wheels and other towing gear for van movement.

**11665-7 PAD UTILITY REQUIREMENTS.** Pads require electrical power, phone and computer line connections, compressed air, and water for washing vans. It will also require an environmental drainage system for wash water runoff.

**11665-8 SUPPORT BUILDING.** The support building is required if the van pad is built away from other facilities or the existing nearby facilities cannot handle the personnel load that would be placed upon them by the extra personnel working in the vans. The pad size guidance provided above DOES NOT include the space required for the support building.

**11665-9 SUPPORT BUILDING SPACE REQUIREMENTS.** The support building is required to house personnel space such as restrooms and locker rooms, storage for van parts such as door and access panels that have been removed for complexing of vans, mechanical equipment rooms for power, phone and computer distribution, and air compressors. The following guidance shall be used to size support building:

- a. Provide 4.6 M2 (50 SF) of covered storage for every two INUs or every four of the other types of vans.
- b. Provide 1.8 M2 (19 SF) per person for restrooms, lockers, showers and dressing rooms.

Either use the actual manning of the van complex  
OR assume 1.2 persons per van.

- c. Provide 13.9 M2 (150 SF) for mechanical equipment area to support the vans.

**11665-10 NET TO GROSS FACTOR.** The support building figures listed above are net M2 (net SF). All figures should be multiplied by 1.25 (net to gross factor) to provide areas for aisles, fire protection, HVAC, and structure.

## Tactical Support Van Pad Sizing - Computation Example 1

An MWCS unit has eight vans consisting of two INUs and six basic vans laid out as shown in Figure 11665-1 "Typical Small Complex Van Pad Layout".

These vans are occupied by 12 personnel.

### Pad Size Calculation:

The layout of the vans is 12.3 meters (40.5 feet) by 14.9 meters (49 feet).

Adding a 0.6 meter (2 foot) border makes the pad 13.6 meters (44.5 feet) by 16.2 meters (53 feet) or 219 M2 (262 SY).

As this is a single group, the 4.6 meter (15 foot) access lane IS NOT required.

Pad Total = 219 M2 (262 SY)

### Support Building Size Calculation:

Number of INUs = 2

Number of others = 6

Number of personnel = 12

Covered Storage:

INUs:  $2 / 2 = 1.0$

Others:  $6 / 4 = 1.5$

$1.0 \times 4.6 \text{ M2 (50 SF)} + 1.5 \times 4.6 \text{ M2 (50 SF)} = 11.5 \text{ M2 (125 SF)}$

Restrooms, Locker Rooms, Showers and Dressing Rooms:

$12 \times 1.8 \text{ M2 (19 SF)} = 21.6 \text{ M2 (228 SF)}$

Mechanical Room:

13.9 M2 (150 SF)

Support Building Subtotal (Net)

$11.5 \text{ M2} + 21.6 \text{ M2} + 13.9 \text{ M2} = 47.0 \text{ M2 (net)}$

$(125 \text{ SF} + 228 \text{ SF} + 150 \text{ SF} = 503 \text{ SF (net)})$

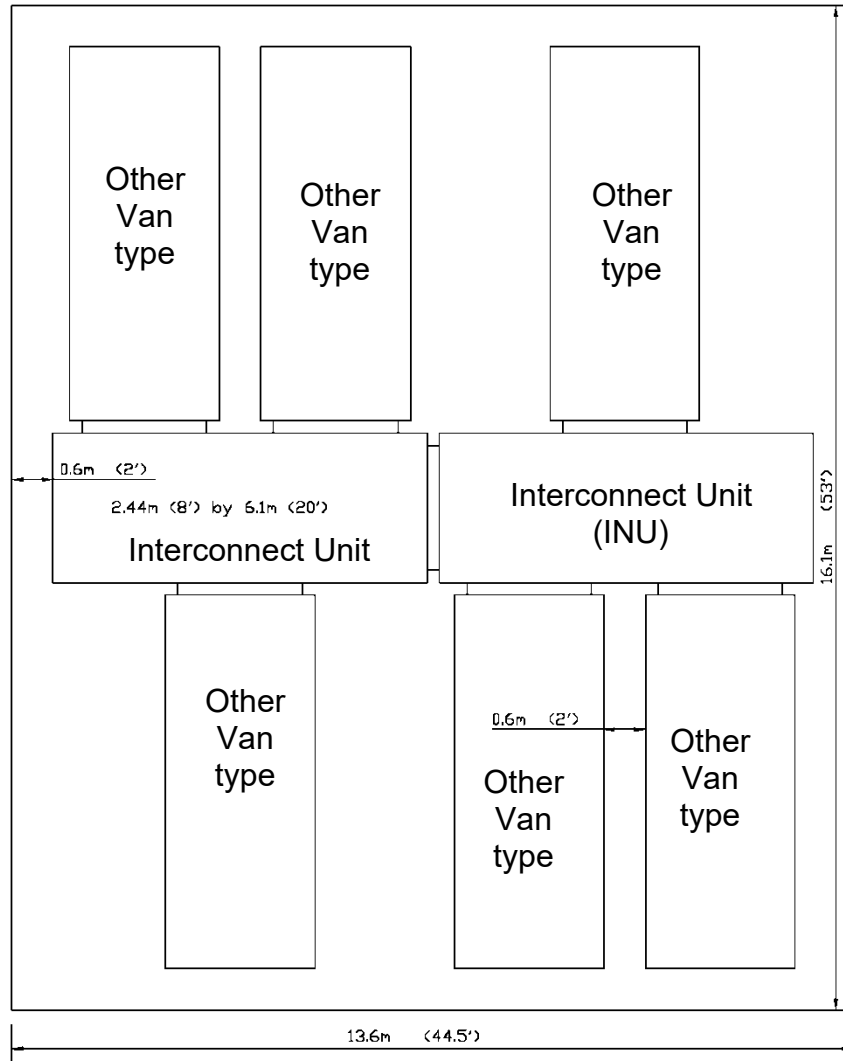
Support Building Total (Gross)

$47.0 \text{ M2 (net)} \times 1.25 = 58.8 \text{ M2 (gross)}$

$(503 \text{ SF (net)} \times 1.25 = 629 \text{ SF (gross)})$



Figure 11665-1. Typical Small Complex Van Pad Layout



NOT TO SCALE

## Tactical Support Van Pad Sizing - Computation Example 2

A MALS unit has 250 vans laid out as shown in Figure 11665-2. "Typical Large Complex Van Pad Layout".

The personnel loading is unknown.

### Pad Size Calculation:

For van complexes consisting of more than 42 vans,  
 $250 / 42 = 5.95$ , say 6 groups

Place a 4.6 meter (15 foot) access lane between each of the 6 groups  
 gives a pad size of 81.7 meters (268 feet) by 95.1 meters (312 feet) or  
 7,770 M2 (9,291 SY)

add 93 M2 (111 SY) for storage

Pad Total = 7,770 M2 + 93 M2 = 7,863 M2  
 (9,291 SY + 111 SY = 9,402 SY)

### Support Building Size Calculation:

Number of INUs =  $6 \times 6 = 36$

Number of others = 250

Number of personnel = unknown (assume 1.2 pn/van x 250 van = 300 pn)

Covered Storage:

INUs:  $36 / 2 = 18$

Other:  $(250 - 36) / 4 = 53.5$

$18 \times 4.6 \text{ M2 (50 SF)} + 53.5 \times 4.6 \text{ M2 (50 SF)} = 328.9 \text{ M2 (3,575 SF)}$

Restrooms, Locker Rooms, Showers and Dressing Rooms:

$1.8 \text{ M2 (19 SF)} \times 300 = 540 \text{ M2 (5,700 SF)}$

Mechanical Room:

13.9 M2 (150 SF)

Support Building Subtotal (Net)

$328.9 \text{ M2} + 540.0 \text{ M2} + 13.9 \text{ M2} = 882.8 \text{ M2(net)}$

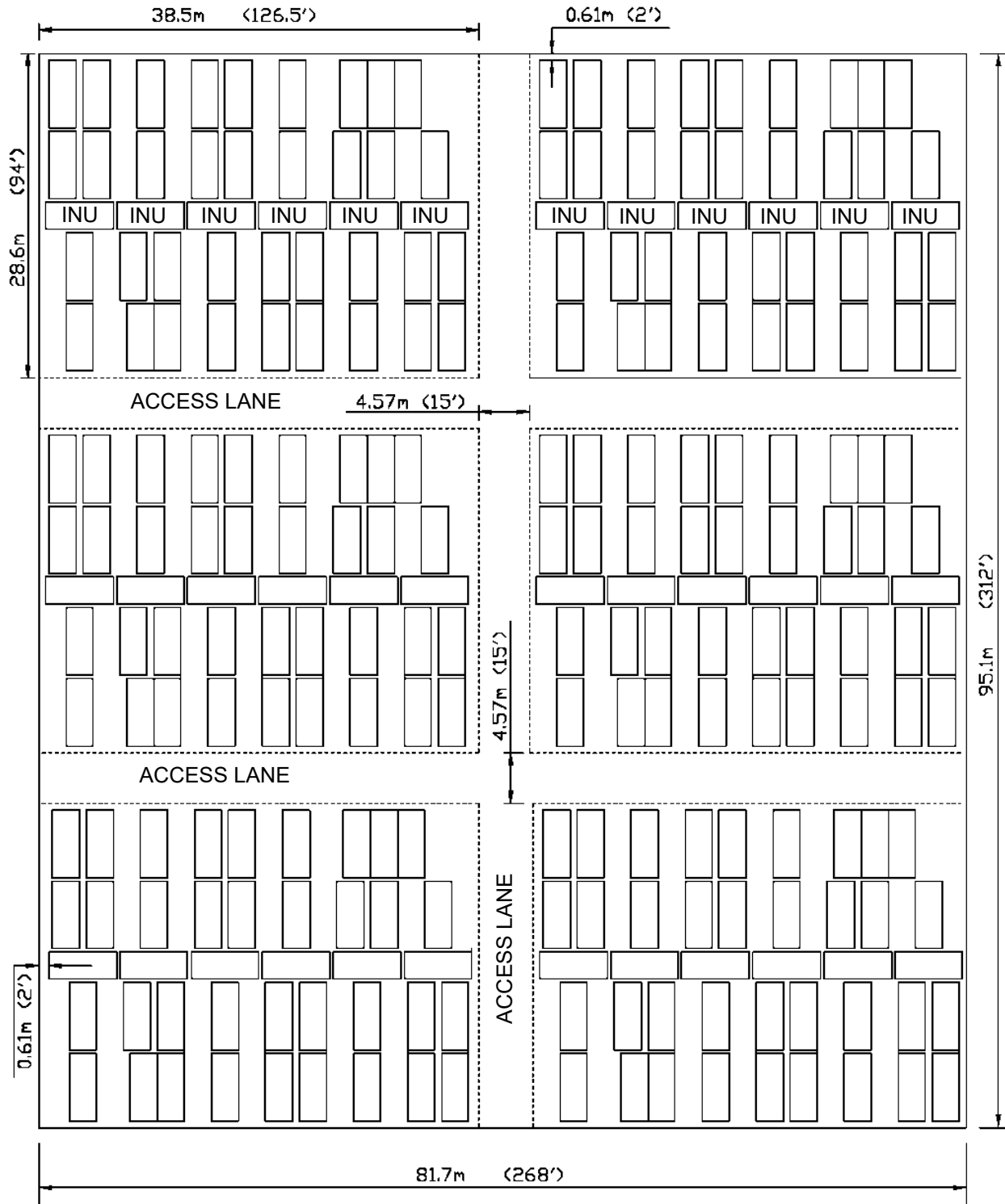
$(3,575 \text{ SF} + 5,700 \text{ SF} + 150 \text{ SF} = 9,425 \text{ SF(net)})$

Support Building Total (Gross)

$882.8 \text{ M2(net)} \times 1.25 = 1,103.5 \text{ M2(gross)}$

$(9,425 \text{ SF(net)} \times 1.25 = 11,781 \text{ SF(gross)})$

Figure 11665-2. Typical Large Complex Van Pad Layout



NOT TO SCALE

## 121 AVIATION FUEL FACILITIES

### 121 10 AIRCRAFT DIRECT FUELING STATION (GM)

FAC: 1211

BFR Required: Y

12110-1 **DESCRIPTION.** Aircraft direct fueling stations provided outlets where aircraft can be fueled from a closed circuit fuel system as opposed to refueler trucks.

12110-2 **POLICY.** Refueler trucks are the preferred method to fuel aircraft. However, direct fueling stations may be considered for: (1) carrier aircraft, including helicopters, when the mission dictates a continuing need for rapid turnaround without shutting engines down, (2) cargo/transport aircraft with prescribed short ground times or (3) patrol aircraft which require an average refueling of 2500 gallons or more. Aircraft direct fueling stations shall be installed only when authorized by NAVFACENGCOCOM HQ and NAVAIRSYSCOM HQ. NAVFACENGCOCOM HQ (Code 04) and NAVAIRSYSCOM HQ (Code 4106) will provide technical assistance for the determination of the type and number of fueling station.

12110-3 **CRITERIA.** Aircraft direct systems utilize multi-arm pantographs with closed circuit type nozzle assemblies. Cargo/transport aircraft may also be refueled from flush type direct fueling stations located in the apron in conjunction with hose/pantograph trailers or trucks. However, flush fueling stations should only be used where taxi patterns preclude the parking of aircraft in spaces which can be reached by apron edge fueling stations with fully extended (135 foot maximum reach) five arm pantographs.

The number of fueling outlets required must be determined by an engineering analysis. Where aircraft require quick turnaround, (i.e. transport aircraft with minimum ground time, tactical aircraft returning to the air without shutting down engines, or patrol aircraft on ready alert status), the number of fueling outlets required is a function of the number of aircraft that must be refueled within the specific time frame. Unified Facilities Criteria (UFC) 3-460-01 "Design: Petroleum Fuel Facilities" provides guidance on the minimum number of outlets, fuel flow per outlet and total fuel flow required in the system. Systems are designed such that the flow in the system is less than the sum of the maximum outlet capacities. Three or four outlets each capable of delivering 600 gallons per minute (GPM) can be adequately served by a system with a capacity of 1200 GPM.

When determining the number of outlets required for simultaneous refueling of aircraft, the average rate at which the aircraft can receive fuel shall be used rather than the maximum GPM capacity of the outlet. For example, if the average fuel receiving rate for an aircraft is 250 GPM (the actual rate varies during filling), and the aircraft normally requires 2000 gallons of fuel, the fill-up time equals 2000/250 or 8 minutes. Allowing 7 minutes for other functions such as brake check, taxiing, hook-up, paperwork, etc., one aircraft can refuel every 15 minutes. In this case, each outlet could fuel 4 aircraft per hour. If the mission requirement is to turnaround 8 aircraft per hour, two outlets will be

required. UFC 3-460-01 "Design: Petroleum Fuel Facilities" specifies a minimum of 2 outlets per fueling system.

12110-4 **SITING REQUIREMENTS.** The location of fueling stations at an activity depends on the aircraft mission and configuration of runways, taxiways, and aprons. The fueling stations may be located adjacent to through taxiways, parking aprons or dedicated fueling taxiways. See NAVFAC P-272, Drawing 1403986, for the layout of a fueling station with dedicated taxiways. Where direct fueling is used to hot fuel tactical aircraft, fueling stations shall be located to allow quick return to the runway. For cargo/transport aircraft, the fueling stations shall normally be located adjacent to where the aircraft are loaded/unloaded so that fueling may be done simultaneously with other logistic operations. Patrol aircraft may be fueled at their parking spaces or at some point en route to the runway.

Direct fueling stations shall be sited outside of the runway or helipad primary surface and such that fueling equipment and the aircraft to be refueled do not penetrate the transitional surface as defined in NAVFAC P-80.3. Direct fueling stations shall not be sited beneath the approach-departure clearance surface. Fueling stations with dedicated access taxiways shall be located a minimum of 100 feet from the edge of a parking apron and 150 feet from the centerline of a through taxiway. The size and spacing of fueling lanes shall be in accordance with NAVFAC P-272, Definitive Drawing 1403986. Normally, when fueling stations are proposed adjacent to parking aprons or through taxiways, an airfield safety waiver from NAVAIRSYSCOM would be required prior to construction. However, in this case no formal waiver is required provided NAVFACENCOM and NAVAIRSYSCOM have approved overall-planning for the project. Aircraft direct fueling stations shall not be sited within 200 feet of an inhabited building. Siting of fuel dispensing facilities must consider the effects of electromagnetic radiation; see UFC 3-460-01 "Design: Petroleum Fuel Facilities" for guidelines.

## **121 20 AIRCRAFT TRUCK FUELING FACILITY (GM)**

**FAC: 1261**

**BFR Required: Y**

12120-1 **DESCRIPTION.** An aircraft truck fueling facility is used to transfer fuel to aircraft refueling trucks. The fueling equipment is located on concrete islands which are designed to provide fuel from one side only. Where more than one island (one fueling outlet per island) is required, they shall be arranged parallel to each other with 15 feet between adjacent sides. The pavement between islands is sloped to a drain or catch basin which is connected to a containment area in case of a fuel spill. See NAVFAC P-272, Definitive Drawing 1403987 for a sketch of a typical refueler truck fill stand and UFC 3-460-01 "Design: Petroleum Fuel Facilities" for design criteria.

12120-2 **POLICY.** The use of refueler trucks is the preferred method to fuel aircraft. However, see Category Code 121 10 to determine when a direct fueling system may be considered. When direct fueling is provided, it is always in conjunction with truck fueling. An aircraft truck fueling facility supplied from a spur of the direct fueling system usually reduces non-productive truck time and is less costly than a separate truck

fueling facility because the filter/separator and fuel monitor would be omitted. Also, depending upon the spurs' location in the system, a relaxation chamber may not be required. See NAVFAC definitive drawing 1403985 and UFC 3-460-01 –“ Design: Petroleum Fuel Facilities”. The determination of number of grades of fuel to be handled and the number of outlets required for each grade shall be made in conjunction with NAVFACENCOM HQ (Code 04) and NAVAIRSYSCOM HQ (Code 4106).

12120-3 **CRITERIA.** The number of outlets required must be determined by an engineering analysis. The maximum capacity of each outlet is 600 gallons per minute (GPM). Factors to be considered in the engineering analysis include:

- **The number of grades of fuel to be provided.** Each grade requires a separate outlet.
- **The number of aircraft that must be refueled during peak periods of recovery and launch.**
- **The rate at which the fueling facility can fill refueler trucks.** Refueler trucks can accept up to 600 GPM, however, a figure of 450 GPM is more typical of rates achieved. Standard Navy refueler trucks can hold 5000 gallons of fuel. The capacity of refueler trucks in contract refueling operations vary and 8000 gallons is not uncommon.
- **The rate refueler trucks can fuel aircraft.** While refueler trucks can dispense fuel at approximately 250 GPM, only the larger and more modern jet aircraft can accept fuel at that rate and then only during the initial refueling phase. For planning purposes, the average aircraft fueling rates should be 200 GPM for large jet aircraft (Patrol/transport), 150 GPM for tactical jet aircraft and 100 GPM or less for rotary wing jets and all reciprocating engine aircraft using aviation gasoline (AVGAS). Some larger aircraft can simultaneously take on fuel from two trucks in which case a combined average flow of 400 GPM can be used.
- **The distance the refueler trucks have to transit between the fueling stand and the aircraft.** The distance should be minimized to reduce transit times.

The analysis should consider that aircraft can be refueled overnight for morning departures. Peak demand for the truck fueling facility will normally occur at mid-morning or mid-afternoon when high rates of aircraft recovery are experienced.

12120-4 **SITING.** Aircraft Truck fueling facilities shall not be sited within the primary surface or under the approach/departure clearance surface of any runway or helipad. The facilities shall be sited so that no part of the fueling stand, equipment or refueler truck penetrates the imaginary surfaces specified in NAVFAC P-80.3 or the airfield safety clearances published in UFC 3-460-01 - Design: Petroleum Fuel Facilities (see criteria for runways, helipads, taxiways, and aprons). The fueling facility shall be at least 100 feet from any building, public road or above ground fuel storage tank. See UFC 3-460-01 –“Design: Petroleum Fuel Facilities” for additional siting restrictions with respect to electromagnetic radiation.

**121 30 AIRCRAFT DEFUELING FACILITY (GM)****FAC: 1242****BFR Required: N**

This Category Code shall be used for inventory of existing facilities only. Aircraft shall be defueled into tank trucks designated for that purpose.

**121 50 AIRCRAFT READY FUELS STORAGE (BL)****FAC: 1241****BFR Required: Y**

Note: Previously listed as Category Code 124 30 AIRCRAFT READY FUELS STORAGE

12150-1 **DESCRIPTION.** Aircraft ready fuel storage provides an operation and reserve supply of aviation gasoline and jet fuel. At air installations all aviation fuel storage shall be categorized as ready fuel storage as opposed to depot level storage; see 411 Category Code series. Aircraft ready fuel storage may be classified as local or remote. The remote are usually designated as the station's fuel farm and provide the majority of the storage capacity. Local storage refers to those storage tanks located close to a fuel dispensing facility. Local storage tanks (or day tanks) can be refilled overnight thereby permitting the use of a smaller diameter pipeline from the remote tanks to the local storage and dispensing area. Local storage such as day tanks should be used settlement prior to dispensing.

12150-2 **CRITERIA.** The fuel storage requirement must be determined by an engineering analysis. The Fleet Fuels Officer, Code N413F, within the US Fleet Forces Command in collaboration with Defense Logistics Agency's (DLA) Defense Energy Support Center (DESC) Code B (Bulk Fuels) will determine the fuel storage requirement. The requirement is a function of: the number and type of aircraft supported, aircraft fuel consumption rates, and the number of hours of flown. At CONUS installations, a ten-day supply is normally provided. At OCONUS installations, a thirty-day supply may be provided. The above days of supply requirements are guidelines and may be modified to reflect restricted or unpredictable fuel delivery schedules. When both local and remote storage are provided, the remote storage capacity requirement shall be reduced by 50% of the tank capacity provided by local storage. See Figure 12150-1 for a sample calculation.

**Figure 12150-1. Example Requirement Calculation**

<p>Given: (1) CONUS 10 day requirement = 500,000 GA  (2) 50,000 GA of local storage is being provided</p> <p>Remote Storage = 500,000 GA – {50% x (local storage)}  = 500,000 GA – {0.50 x (50,000 GA)}  = 500,000 GA – 25,000 GA  = 475,000 GA</p> <p>Total (121 50) Requirement  = local + remote  = 50,000 GA + 475,000 GA  = 525,000 GA</p>
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12150-3 **SITING.** Fuels storage tanks must be separated from each other, buildings, property lines, roads, railroads lines, and power lines. The fuel farm layout, design and siting are available in the Unified Facilities Criteria Design: Petroleum Fuel Facilities (UFC 3-460-01 dated 16 Jan 2004).

## 122 MARINE FUEL FACILITIES

### 122 10 MARINE FUELING FACILITY (GM)

**FAC: 1221**

**BFR Required: Y**

Design Criteria: refer to UFC 3-460-01: "Design: Petroleum Fuel Facilities"  
(replacement for NAVFAC Design Manual DM-22)

12210-1 **DESCRIPTION.** A marine fueling facility is designed for small vessels and capital ships and should be able to refuel the largest ship that can dock at the station's waterfront. The facility may have the outlets located on a general purpose berthing pier, a combined cargo and fueling pier or on a separate fueling pier, depending on the station's mission, logistics, and base location.

12210-2 **ADDITIONAL REQUIREMENTS.** In addition to the pier outlets, the facility has a piping approach trestle, a pumping station, security fencing, hose racks, access roads, fire protection and ready marine fuel storage tanks. Surge storage tanks, if required, are categorized under code 124-70 and bulk marine fuel storage tanks are categorized under code 411-10, Ship Fuel Storage. Fuel piers or wharves will vary greatly according to the services required. Some may be of the simple type having one ship berth and a minimum-size dock platform to the more elaborate pier head or finger-type having two or three ship berth all provided with the appropriate fuel bunkering connections.



12210-3      **SEPARATION DISTANCES.** There should be 1,800 feet between tankage and the nearest station structure or boundary fence. Consideration must be given to safe distances from other buildings and facilities.

## **122 20    SMALL CRAFT FUELING STATION (GM)**

**FAC: 1221**

**BFR Required: Y**

Design Criteria: refer to UFC 4-150-01 "Piers and Wharves"

12220-1      **DESCRIPTION.** A small craft fueling station is used to refuel such small craft as crash boats and administrative boats. It shall include dispensing pedestal-type commercial pumps, piping, tanks, hoses, floodlights and grounding devices, electrical power, and fire protection.

12220-2      **CAPACITY.** There will be at least one separate pump for each grade of fuel used and each shall have a minimum backup storage of 5,000 gallons. The station will normally dispense a minimum of two grades of gasoline and diesel fuel and shall have sufficient capacity to service three boats simultaneously. This may be modified to conform to the type and number of small craft serviced.

12220-3      **SITING.** The small craft fueling station, except for the storage tanks, is a part of the Small Craft Berthing facility. It is acceptable to locate fuel storage tanks in remote areas. The spacing of these tanks will be in accordance with criteria set forth in See Category Code 122 30 for additional fuel storage information.

## **122 30    SMALL CRAFT READY FUEL STORAGE (GA)**

**FAC: 1242**

**BFR Required: Y**

Note: Previously listed as Category Code 124 40 SMALL CRAFT READY FUELS STORAGE

12230-1      **DESCRIPTION.** A marine ready fuel storage tank is the ready issue operation storage of a particular grade of fuel for small boats and yard craft. These boats will include small tugs, security boats, repair barges, etc. The boats may be operated by several different departments within or tenants operating at the installation including: Public Works, Base Security, Naval Coastal Warfare Command, Amphibious Group Two, Naval Special Forces Command, etc. Large ships will refuel at depot fueling piers or via fuel barges. For depot level fuel storage see Category Code 411. See Category Code 122 20 (Small Craft Fueling Station) for the fuel dispensing facility which includes commercial fuel pumps, piping from the tank to the pump, hoses, floodlights, and other equipment for dispensing the fuel.

12230-2      **CRITERIA.** The fuel storage requirement must be determined by an engineering analysis. The Fleet Fuels Officer, Code N413F, within the US Fleet Forces Command in collaboration with Defense Logistics Agency's (DLA) Defense Energy Support Center (DESC) Code B (Bulk Fuels) will determine the fuel storage

requirement. The requirement is a function of: the number and type of boats supported, fuel consumption rates, and the number of hours of driven. At CONUS installations, a ten-day supply is normally provided. At OCONUS installations, a thirty-day supply may be provided. As minimum, the ready fuel storage will be one 5,000-gallon gasoline tank for each octane grade and one 5,000-gallon diesel fuel tank. The tanks will include the piping for fuel delivery to the tanks, pumps for pumping fuel into the tanks, tank security fencing, tank fire protection, and paving for fuel delivery, as required.

12230-3 **SITING.** Fuels storage tanks must be separate from each other, buildings, property lines, roads, railroads lines, and power lines. The fuel farm layout, design and siting are available in the Unified Facilities Criteria (UFC) 3-460-01 "Design: Petroleum Fuel Facilities".

## 123 LAND/GROUND VEHICLE FUELING/DISPENSING FACILITIES

123-1 This Category Code group is for facilities serving official government land vehicles and equipment only. If NEX operates the facility, see Category Code 740-30/31, Exchange Service and Auto Repair/Supplemental Gasoline Station. For Aviation Fueling and Dispensing, see Category Code Series 121. For Marine and Small Craft Fueling and Dispensing, see Category Code series 122. For bulk fuel storage such as tank farm installation, see Category Code series 411.

### 123 10 FILLING STATION (OL)

**FAC: 1231**

**BFR Required: Y**

12310-1 **DESCRIPTION.** A filling station is a fueling facility for official vehicles and equipment on Navy and Marine Corps installations. This Category Code applies to pump outlets including the covered islands that support the pump outlets, the concrete parking area, lighting and the access paving to the pumps/islands.

12310-2 **ITEMS INCLUDED IN STATION.** In the event the installation still has a filling station, the following items will be included:

- Three dispensing pumps (Outlet – OL) for each 250-gasoline engine vehicles in the official motor pool:
  1. One pump for gasoline that can dispense each of the three of standard octane grades gasoline (low, medium, high octane if required)
  2. One pump for diesel fuel
  3. One pump for other fuel if needed (i.e., leaded fuel if required, etc.)
- Allowance for associated safety and environmental equipment

12310-3     **EXCLUSIONS.** This Category Code excludes the fuel storage tanks and filling station building; see Category Code 123 30 for tank storage and Category Code 123 15 for shelter.

**123 15    FILLING STATION BUILDING (SF)**

**FAC: 1444**

**BFR Required: Y**

12315-1     **DESCRIPTION.** This code is used for reporting the administrative shelter associated with a filling station. If the filling station is operated by a private entity, then use the 740-30/31 Category Codes. Where credit card systems are used and operators are not needed, a shelter is not required. A shed may be provided to protect or house equipment.

12315-2     **REQUIREMENT.** This code should also include the following:

- Minimum size shelter is 6’x6’
- Control/monitoring room area
- Access road and 400 SF of pavement at each pump with appropriate curbing for spills and containment
- Area lighting and signage

**123 16    OVERHEAD COVER, AIRFIELD (SF)**

**FAC: 1459**

**BFR Required: N**

12316-1     **DESCRIPTION.** This category code was created for inventory purposes. It can be used for overhead covers located on the airfield (that are not classified as equipment).

**123 17    OVERHEAD COVER, MISCELLANEOUS (SF)**

**FAC: 1459**

**BFR Required: N**

12317-1     **DESCRIPTION.** This category code was created for inventory purposes. It can be used for overhead covers located at the main gates of installations, overhead covers atop gas pumps, and any other time that an overhead cover is used.

**123 30 VEHICLE AND EQUIPMENT READY FUEL STORAGE (GA)****FAC: 1243****BFR Required: Y**

Note: Previously listed as 124 50 VEHICLE READY FUEL STORAGE

12330-1 **DESCRIPTION.** This code is used for reporting the tank storage requirement associated with Category Code 123 10 and 740 30, including those tanks in remote locations that are considered Real Property.

NOTE: Tanks that are skid mounted and/or designed to be moved to various locations are considered equipment. Tanks that are provided by vendors are also considered equipment. This Category Code does not apply to equipment.

12330-2 **NUMBER OF TANKS REQUIRED.** One tank for each grade of fuel required (low, medium, and high-octane fuels; diesel fuel; and other fuels as required).

12330-3 **STORAGE CAPACITY.** The total amount of storage capacity in each station should be twice the capacity of all fuel tanks of vehicles and equipment assigned to an activity.

12330-4 **MINIMUM NUMBER OF GALLONS.** Service station tanks should be a minimum of 5,000 gallons unless approved by Service Headquarters. For other tanks, such as heating fuel, small tanks may be used.

12330-5 **ADDITIONAL REQUIREMENTS.** In addition, there should be a 10-day total storage capacity for CONUS bases and a 30-day total capacity for overseas bases. This total storage should be based on high average such as winter months for heating oil. Location of base and access to fuel resources as well as current delivery schedules should be considered when developing this immediate backup fuel requirement. Don't forget to include emergency generators for buildings and utilities that may be needed in a hurricane or other base emergency. Some of these generators and equipment may have service contracts (i.e., utilities privatization, etc.) that should not be included in these calculations. A good resource for the rate of consumption information is the historical accounting and billing records. If records are not available, provide 32 gallons per vehicle for each type of fuel used at overseas bases. Equipment requirements will vary.

12330-6 **ALTERNATE UNIT OF MEASURE.** Barrels (BL) may be used as an alternative unit of measure.

12330-7 **EXCLUSION.** For fuel oil or heating fuel see Category Code 126 15 Petroleum Fuel Storage Facility.

**123 40 ETHANOL READY FUEL STORAGE (GA)****FAC: 1243****BFR Required: Y**

12340-1      **DESCRIPTION.** This category is for alternative fuel facilities in support of ethanol operation of vehicles.

**123 50    BIODIESEL READY FUEL STORAGE (GA)**

**FAC: 1243**

**BFR Required: Y**

12350-1      **DESCRIPTION.** This category is for alternative fuel facilities in support of biodiesel operation of vehicles.

## **125            POL DISTRIBUTION / PIPELINE FACILITIES**

125-1            This category is for pipelines and accessory equipment between tank farms and operating fuel storage facilities and intermediate points.

**125 10    POL PIPELINE (MI)**

**FAC: 1251**

**BFR Required: N**

12510-1      **DESCRIPTION.** Separate fuel lines should be used for each type of fuel stored at the activity. Underground pipelines are preferred and should be used wherever practical, therefore eliminating thermo-solar effects. In some instances, subaqueous pipelines will be required for crossing harbors or through marshy areas. Submarine pipelines have specific design requirements unique to sub refueling. This category will include in-line fuel filtering systems, sensors, alarms, manifolds, area lighting for the pipeline, paving and piers. A surge tank is required for pipeline systems; see Category Code 125 30.

12510-2      **GENERAL PLANNING NOTES.** The capacity and size of the pipeline will have a direct impact on rate of flow as well as exposure to temperature changes. The design criteria are provided in the Unified Facilities Criteria Design: Petroleum Fuel Facilities (UFC 3-460-01 dated 16 Jan 2004). In distributing fuel oil, large pipelines are preferred. Whenever crossing private property be sure to include access roads and maintenance areas paralleling the pipeline. The maintenance area should not be less than 16 feet wide. Daily consumption, storage requirements, delivery schedules, length of delivery, and thermo-solar effects should all be considered when designing POL pipeline. Only the length of the POL is needed for this category requirement. Looped systems are preferred, so be sure to add this to total length of the pipeline. The loop will provide flexibility, reliability and contributes to product cleanliness as well as reduce the magnitude of hydraulic shock.

**125 16 POL PIPELINE PUMP STATION AND ANCILLARY EQUIPMENT (EA)****FAC: 1262****BFR Required: N**

12516-1 **DESCRIPTION.** This Category Code includes pumping stations and ancillary equipment used to move the fuel through the pipes. This facility may also include controls, gauges, meter, lighting, fire protection, and ventilation. An alternative unit of measure may be cubic feet per minute (CM). Underground pump stations are preferred around runways.

**125 20 SHED/SHELTER FOR PUMP STATION AND ANCILLARY EQUIPMENT (SF)****FAC: 1459****BFR Required: N**

12520-1 **DESCRIPTION.** This code is for the building or structure housing pumping stations and ancillary equipment.

12520-2 **REQUIREMENT.** Facility should be large enough to house or shelter equipment with ample space allow performance of maintenance to housed equipment. Typically 2 - 4 feet of clearance is adequate. In lieu of net to gross factor, add in wall thickness if facility is enclosed.

**125 21 POL PIPING-SINGLE SITE (LF).****FAC: 1252****BFR Required: N****125 30 SURGE STORAGE (GA)****FAC: 1244****BFR Required: N**

Note: Previously listed as Category Code 124 70 SURGE STORAGE

12530-1 **DESCRIPTION.** A surge tank is used where there is a risk of hydraulic shock. Hydraulic shock can occur when the pump used to deliver fuel is greater than the pipeline capacity; unloading rate of the delivery tanker/barge exceeds the rate of the shore pumping system; or water, air or other blockage occurs in the pipeline. One surge tank is required each type of fuel. The size of the surge tank will be determined by the size of the tanker unloading at the facility and the capacity of shore booster pumps. UFC 3-460-01 suggests computer modeling to determine need and tank size.

**126 OTHER LIQUID PETROLEUM PRODUCTS FACILITIES**

126-1 Use this Category Code for liquid fuel or petroleum products facilities not specifically related to aviation, marine craft, or ground vehicle fuel requirements (see Category Codes series 121, 122, and 123, respectively). Use Category Code 821 60 or 821 61 for heating plant fuel storage. This Category Code includes fuel loading and

unloading; drum storage, loading and maintenance; and miscellaneous fuel storage (i.e., heating fuel, kerosene, propane, fuel oil, etc.). See Category Code series 411 for depot level storage.

## **126 10 DRUM AND CAN LOADING FACILITY (SF)**

**FAC: 1261**

**BFR Required: Y**

12610-1 **DESCRIPTION.** A drum and can loading facility is a fuel facility equipped to fill drums with fuel oil, diesel, kerosene, jet engine fuel, motor gasoline, aviation gasoline, and lubricating oils. The facility may also be provided with a drum reconditioning plant. Drum storage areas may also be needed. Drums with varying fuel may be stored in one storage area. Others may be separated; see Unified Facilities Criteria Design: Petroleum Fuel Facilities (UFC 3-460-01 dtd 16 Jan 2004). There may be one storage area for empty drums and another storage area for filled drums. The drums have 55-gallon capacity. This facility should not be used for storage of contaminated fuel or waste oil ready for disposal; see hazardous waste facilities under Category Codes 831 41 and 831 42.

12610-2 **STORAGE.** Jet engine fuel and gasoline drums shall be stored outside in designated compounds. Special construction features will be required if an outside compound is not available. Drummed products with a flash point of 100 degrees Fahrenheit shall contain no more than 5,000 drums. Drummed products with a flash point above 100 °F may be stored in groups of 10,000 or less. When possible, racks and pallets should be used to reduce the footprint utilized to store drums.

12610-3 **WORK PLATFORMS.** The drum filling area shall include a work platform covered with an open shed. A separate platform shall be used for each type of fuel with individual pipelines for each of the various fuel types. The pipeline will run from the storage tank to a fuel manifold to the outlet (see Category Code 126 15 for storage tank). Each platform will have 2 outlets, spaced at 10-foot intervals. A mechanical drum conveyor system or equipment may be used to carry the drums, depending on the size of the operation.

12610-4 **SMALLER QUANTITIES.** For smaller operations where the fuel products are delivered in drums, only a small fuel/petroleum storage area may be required to hold a limited number of drums; in this case, use Category Code 441 30. For very small quantities, a hazardous material storage locker may be used.

## **126 15 PETROLEUM READY FUEL STORAGE FACILITY (GA)**

**FAC: 1244**

**BFR Required: Y**

Note: Previously listed as Category Code 124 20 DRUM AND CAN READY FUEL STORAGE and Category Code 124 65 ACTIVITY HEATING FUEL STORAGE

12615-1 **DESCRIPTION.** This category shall be used for the storage of petroleum products used to fill drums as provided in Category Code 126 10, heating oil tanks (see Category Code 821-60 or 61 for heating plant fuel storage), lube oil tanks, grease, propane tanks, or fuel storage tanks for generators and other equipment. This Category Code should not be used for those items included in Category Code series 121, 122, and 123.

12615-2 **REQUIREMENT.** The normal storage for CONUS would be a 10 day supply and for OCONUS a 30 day supply. Historical annual data may be used to determine average daily consumption, then multiply that times the number of days supply needed to get the total storage requirement for each type of petroleum product stored. For storage tanks associated with one piece of equipment such as a building generator, sewage pump station or building heater, check equipment specifications and emergency requirements. Some facilities or activities may have specific hurricane or other emergency requirements that should be taken into consideration. If this activity has a drum loading facility, the size and number of drums should be added to the storage requirements for each type of fuel or petroleum product. Design should factor in fuel delivery schedules and availability. If emergency requirements dictate, additional storage may be required.

12615-3 **ALTERNATIVE UNIT OF MEASURE.** The alternative unit of measure is gallons, (GA).

## **126 30 TANK TRUCK TANK CAR LOADING FACILITY (OL)**

**FAC: 1261**

**BFR Required: Y**

12630-1 **DESCRIPTION.** This Category Code applies to a tank truck loading facility (either a truck fill stand or stands) that dispense fuels other than aircraft fuels to delivery trucks. (For information on an aircraft truck fueling facility, see Category Code 121 20.) Each stand has one dual outlet, a meter, static line, platform, roadway, strainer and necessary valves, piping, pump, and electrical controls. For design criteria, see UFC 3-460-01.

12630-1.1 **Outlet Requirements.** A tank truck loading facility is required at those installations without contract refueling and automotive ready fuel storage facilities. There shall be at least one outlet for each grade of fuel, capable of dispensing fuel at the rate of 250 to 600 gallons per minute. The total number of outlets will vary with the station population, mission, and the number of fuels used. A tank truck loading island is 38 feet 9 inches long by 6 feet 0 inches wide.

12630-2 **PROVIDING FOR MULTIPLE TYPES OF FUEL.** Facilities for issue of fuel by tank car shall be provided when specified by NAVFAC. The fuel normally issued will be jet engine fuel and gasoline, but diesel fuel oil and other fuel oils may be included. Separate pipe lines shall be provided from the storage tanks for each type of fuel.



12630-2.1 **Railroad Siding and Sludge Transfer Disposal.** The normal installation will provide for a railroad siding to each side of the loading island with a length to accommodate six cars on each side. A tank car issuing facility may also be used for disposal of sludge from storage tanks, and for this purpose special pipe lines to the facility shall be provided for sludge transfer.

12630-2.2 **Rate at Which Facilities Will Provide for Receipt of Fuel.** Tank cars are generally of 8,000- and 10,000-gallon capacity. However, there are some tank cars of 12,000-gallon capacity.

#### **126 40 TANK TRUCK/TANK CAR UNLOADING FACILITY (OL)**

**FAC: 1261**

**BFR Required: Y**

12640-1 **DESCRIPTION.** A tank car unloading facility unloads liquid products from tank cars. Each facility has static lines, strainer, access road, security fencing, lighting, necessary valves, piping, pump, electrical controls, and a shelter structure for use of accounting and/or control house. For design criteria, see UFC 3-460-01.

12640-2 **REQUIREMENT.** The number of cars to be accommodated at an unloading facility shall be determined by a survey. There will be one unloading connection for each car. The tank car unloading facility will provide 400- to 800-gallon fuel transfer rate between each tank car and storage.

12640-3 **QUANTITY OF TANK TRUCK UNLOADING FACILITIES.** Tank truck unloading facilities shall be determined by a survey. Facilities should be capable of handling the entire daily fuel requirements in 8 hours. Where unloading facilities by railroad tank cars are available, paved aprons should be provided adjacent to sidings so pumping facilities may serve both tank cars and tank trucks.

# 131 COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS, COMBAT SYSTEMS, INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE (C5ISR) BUILDINGS

131-1 **DEFINITION.** This group of shore facilities supports the reception, processing, distribution, and/or transmission of classified and unclassified voice, data, and video communications in support of the Navy and Marine Corps organizations. Table 131-1 provides a matrix identifying which types of C5ISR functions are best represented for each category code.

**Table 131-1. Category Code Functional Space Matrix**

Function/Command	131 15	131 24	131 35	131 40	131 50	143 65	143 80
Base Communications Office	X						
Information Technology Office	X						
Data Center or Server Center	X						
Navy Information Operations Command (NIOC)	X						
Naval Computer and Telecommunications Station (NCTS) / Naval Computer and Telecommunications Master Area Station (NCTAMS)	X						
Satellite Communications (SATCOM)		X					
Receiver/Transceiver Function			X				
Unmanned Telecommunications Distribution				X			
Transmitter Function					X		
Region/Installation Operations Center						X	
Mission Operation Command and Control							X
High Density Computing Center	X						

131-2 **REQUIREMENT PROCESS.** Unless otherwise specified, the following requirements process should be utilized when planning C5ISR buildings. C5ISR buildings are unique in that they are specifically tailored to a Navy or Marine Corps activity. As a result, engineering evaluations, manning, and equipment configurations may also be required. This information should be used with the guidance provided below to determine the basic facility requirements.

131-3 **SECURITY.** Security issues and operational efficiencies may result in the co-location of office space, equipment space, associated maintenance space, and other associated support/storage space within respective commands.

131-4 **RESILIENCY.** The design of buildings and infrastructure to withstand, absorb, or avoid damage without suffering catastrophic failure is critical to C5ISR

facilities. C5ISR facilities must be planned to provide the appropriate level of continuity of operations based on the individual mission of the tenant. There are three facets to the resiliency of C5ISR facilities: Tier Classification, Survivability, and Antiterrorism/Force Protection. All three of these facets must be addressed in basic facility calculations, facility design, and project cost estimating.

**131-4.1 Tier Classification.** The Tier Classification system, as defined by the Uptime Institute, is used to identify the appropriate redundancy requirements for power, cooling, maintenance, and capability to withstand a failure. Planning criteria should address any additional space requirements based on the Tier level required. The Tier Classification system is further described in the “Tiers Standard Topology” available at the Uptime Institute website:

<https://uptimeinstitute.com/resources/asset/tier-standard-topology>

**131-4.2 Survivability.** Survivability is the ability of the overall building to withstand failure due to natural disaster such as earthquakes, hurricanes, tornados, flooding, and sea level rise - all of which are dictated by the climate in the geographic location of the existing or proposed facility.

**131-4.3 Antiterrorism/Force Protection (AT/FP).** The facility must be planned to meet antiterrorism and force protection requirements as identified in UFC 4-010-01, DoD Minimum Antiterrorism Standards for Buildings and UFC 4-010-02 DoD Minimum Antiterrorism Standoff Distances for Buildings.

**131-5 FUNCTIONAL AREAS.** C5ISR facilities may contain the following functional areas: General Administrative Space, Special Purpose Space, C5ISR Operations Space, Maintenance Space, Training Space, Equipment Space, and IT Logistics Support Space.

**131-6 PERSONNEL LOADING.** All C5ISR BFRs should be based on an official personnel loading source, projected loading year, and associated personnel loading. The official personnel loading analysis must be provided separately to support the requirement. The personnel loading document should include all assigned billets to include: military (including reservists), civilians, students, and contractors. Each billet should be assigned a space type of: private office, cubicle, shared, or special as defined below:

**131-6.1 Private Office.** Personnel that are entitled to an office include supervisory personnel or special billets that require privacy such as a legal officer or financial manager. See section 131-7.1 for calculation criteria.

**131-6.2 Cubicle.** Personnel that require a non-operations workspace but do not require a private office as stated in section 131-6.1 are assigned cubicles. See section 131-7.2 for calculation criteria.

**131-6.3 Shared.** Personnel assigned to watch sections are assigned to shared workstations, which are provided based on the watch stations required, not the total personnel assigned. Personnel that work in the maintenance spaces are also

assigned to shared areas. The quantity of workstations required is calculated using the number of positions in the Watch Center and/or the number of workstations required to support the maintenance function. See Sections 131-9.1, "Watch Center" and 131-10 "Maintenance Space" for calculation criteria.

131-6.4 **Special.** Personnel that conduct analysis or operations functions that require space greater than that allotted by a cubicle are assigned the category of "Special", see Section 131-9.2 "Analysis Operations" for calculation criteria. This space type is also used to classify specific billets such as the Special Security Officer, which is provided a specific space allotment under Section 131-8, "Special Purpose Space".

131-7 **GENERAL ADMINISTRATIVE SPACE.** General Administrative Space types are justified to support administrative or similar functions. They include: private and open office spaces.

131-7.1 **Private Office.** Private Offices are typically provided for supervisory and other personnel based upon specific job requirements. These offices typically have full-height walls, or partitions, from finished floor to finished ceiling.

Planning factor: Allocate 120 NSF/PN requiring Private Office space.

Justification: Private Offices are justified for supervisory personnel or for those positions whose job duties require privacy such as legal or financial officers.

131-7.2 **Open Offices.** Open Offices are programmed and designed to incorporate modular workstations, which are typically occupied by general administrative and/or functional support staff. Personnel assigned as requiring a cubicle per the personnel loading are assigned to Open Office space.

Planning factor: Allocate 64 NSF/PN requiring Open Office space.

131-8 **SPECIAL PURPOSE SPACE.** Special Purpose Spaces are additive and must be individually justified in support of specific missions or functions. For C5ISR missions, the following Special Purpose Spaces may be authorized with justification.

131-8.1 **Special Purpose Space – Basic.** Basic Special Purpose Spaces include allowances for Administrative Support, Auditorium, Break Room, Break Room Kitchen, Classified Material Storage (CMS) Vault, Conference/Training Rooms, Duty/Bunk Room, Mailroom, and Technical Publications Area.

131-8.1.1 **Administrative Support Space.** This space supports the administrative functions and includes the following:

- Conference room equipment storage (e.g. AV equipment, chairs, lecterns, tables)
- Day lockers
- Group file storage (excluding individual file storage provided within modular furniture)
- Lactation room(s)

- Office equipment and supply storage
- Reception area(s)

Planning factor: Allocate 8 NSF/PN requiring Administrative Support Space.

131-8.1.2 **Auditorium.** A large area performing the function of an auditorium may be required for commands with more than 250 personnel. The size of this area is dependent on the staffing and size of the organization.

Planning factor: Allocate 150 NSF plus 10 NSF per seat based on the largest department of the command.

Justification: An Auditorium may be justified under special circumstances.

Justification should address some or all of the following factors as appropriate:

- Mission or functions performed
- Size of organization is greater than 250 personnel
- Other justification

131-8.1.3 **Break Room.** A Break Room w/o Kitchen is a staff-only space, used for breaks and lunches. It typically includes some or all of the following: coffee bar, microwave oven, MWR drink/snack space, refrigerator, water cooler.

Planning factor: Allocate 2 NSF/PN assigned.

131-8.1.4 **Break Room Kitchen.** A full kitchen may be provided, with justification, if a command has 24-hour operations or if the facility is located in a remote location with no food service options available on-site or near by. A Break Room Kitchen is a staff-only space. It may include some, or all, of the following: coffee bar, cupboards, microwave, refrigerator, stove, sink and meal preparation space.

Planning factor: Allocate an additional space for a kitchen equal to one third of the total Break Room requirement, up to a maximum of 150 NSF. This area is considered an additional requirement above and beyond the total Break Room requirement.

Justification: A Break Room Kitchen may be justified for operational functions.

Justification should address some or all of the following factors as appropriate:

- Mission or functions performed
- Distance from food service facilities
- Other justification

131-8.1.5 **Classified Material Storage (CMS) Vault.** A CMS Vault is a secured area for handling classified material. For C5ISR functions, this type of facility is only provided when the primary facility is unclassified and intermittent access to classified materials and networks is required. Additionally, this space is not intended to be the primary workspace for any staff. It may include a worktable at 50 NSF and up to a maximum of 5 workstations at 64 NSF each. The number of workstations required must be provided by the organization for which the space requirements (BFR) are being prepared.

*Note: If a portion of an organization operates at a higher classification than the rest of the facility, the space provided for them is calculated based on the overall requirements set forth in the 131 Introductory Criteria with an additional justification provided indicating the requirement for any additional physical separation, construction requirements, and security requirements.*

Planning factor: Allocate 50 NSF (for a worktable) and up to a maximum of 5 workstations at 64 NSF, each based on specific requirements of the organization.

Justification: A CMS Vault room may be justified for various organizations or functions. Justification should address some or all of the following factors as appropriate:

- Mission or functions performed
- Number of workstations required
- Number of vaults required (if more than one)
- Other justification as necessary

**131-8.1.6 Conference/Training Rooms.** Conference/Training Rooms provide space for staff meetings, briefings, and training sessions. The total allocation may be adjusted in terms of number and size of conference rooms to meet organizational needs.

Planning factor: Allocate total NSF space requirement based on the Conference Room Table 61010-1.

**131-8.1.7 Duty/Bunk Room.** A Duty/Bunk Room is required when the mission requires 24 hours a day, 7 days a week operations.

Planning factor: Allocate 130 NSF for a Duty/Bunk Room.

Justification: A Duty/Bunk Room may be justified for any C5ISR function with an overnight watch that requires overnight accommodations for the duty officer and requires approval from the Installation Commanding Officer. Justification should address some or all of the following factors as appropriate:

- Mission or functions performed
- Watch schedule
- Other justification

**131-8.1.8 Mailroom.** A Mailroom accommodates processing and distribution of the facility's incoming and outgoing mail and parcels. It may accommodate screening requirements as necessary based on security requirements. Ensure adequate storage and work space. The mail room should be adjacent, and provide direct access, to the shipping/receiving area. A mail room must be individually justified for operational, site specific or other reasons such as large size of organization.

Planning Factor: Allocate 40 NSF for every 50 personnel assigned.

Justification: Address some or all of the following factors as appropriate:

- Mission or functions performed.
- Size of organization - Is organization large enough to warrant its own mail room rather than rely on the host installation's centralized postal facility?
- Location of organization - Does geographic separation of the organization from the host installation site warrant a standalone mailroom?
- Security - Do security requirements warrant a mail room?
- Mail room hours of operation (e.g., full-time or part-time)
- Other justification

131-8.1.9 **Technical Publications Area.** A Technical Publications Library provides ready access to technical manuals, handbooks, and other guidance.

*Note that the need for technical/legal/other libraries has diminished as many resources are now readily available online; however, some functions still require access to printed publications.*

As a space saving measure, consider combining technical libraries with small conference/training rooms, rather than providing a separate allocation. This area may be required to store reference publications and literary data. It is configured similar to a reference library and contains bookshelves, a reference area, and a working space for a minimum of two people. This requirement must be justified based on mission operational requirements.

Planning Factor: Allocate 300 NSF.

Justification: A Technical Publications Library may be justified for technical components or divisions of an organization. Justification should address some or all of the following factors as appropriate:

- Mission or functions performed
- Function(s) supported (e.g., architecture, engineering, legal, other)
- Number and size of technical libraries required
- Other justification

131-8.2 **Special Purpose Space – Fitness, Locker, and Shower.** Fitness Rooms, Locker Rooms, and Shower Rooms may be authorized as described below:

131-8.2.1 **Fitness Room.** A Fitness Room is a space specifically designated for exercise, fitness training, and physical wellness activities. Fitness Rooms are only allowed in accordance with CNICINST 1710.1, whereby an organization has more than a 15 minute commute by vehicle to the nearest Morale Welfare and Recreation (MWR) Fitness Center or if active duty personnel are required to be on station and unable to leave for 18 hours at any given time. A fitness room must also have approval from the Installation Commanding Officer. If approved, calculate the requirement separately under Category Code 740 45 Fitness Room.

**131-8.2.2 Locker Room.** A Locker Room provides individual secured storage space for a change in clothing and other personal belongings. Lockers are authorized in support of 24-hour, multiple shift operations. Lockers may also be authorized in support of military physical training requirements at remote locations, without access to fitness centers.

- When lockers are authorized in support of 24-hour, multiple shift operations, one locker, for every 10 PN based on the largest shift, should be provided.
- When lockers are authorized in support of physical training requirements for military personnel at remote locations without access to fitness centers, one locker for every 20 military personnel assigned should be provided.
- If the locker room is required due to overseas operations, where personnel are not allowed to travel to and from the installation in uniform, 1 locker per military staff is allowed with Installation policy provided as justification.

Use the guidance above to determine the number of lockers required.

Planning Factor: Allocate 8 NSF/Locker each.

Justification: A Locker Room may be justified to support physical training requirements for military personnel, and may be applicable to certain personnel that do not occupy a dedicated workspace, such as security personnel or workstation operators working in shifts. Justification should address some or all of the following factors as appropriate:

- Mission or functions performed
- Type of operations supported (normal, shift, emergency)
- Physical Training (PT) requirements at remote locations
- Overseas Installation uniform policy
- Type of locker space required (e.g., shared, dedicated, other)
- Types of personnel that require locker space (e.g., military, civilian, or contractor personnel)
- Types of personnel that require locker space (e.g., military, civilian, or contractor personnel). Military personnel may require locker space in support of mandatory physical fitness requirements. Military, civilian and/or contractor personnel may require locker space in support of shift or emergency operations. Other (e.g. security) personnel that do not occupy a dedicated work space, may require locker space.
- Other justification

**131-8.2.3 Shower Room.** A Shower Room provides one or more shower stalls and is typically collocated with a locker room and/or bathroom. Showers are authorized in support of critical 24-hour, multiple shift operations. Showers may also be authorized in support of military physical training requirements at remote locations without access to fitness centers.

- When showers are authorized in support of 24-hour, multiple shift operations, one shower for every 10 PN, based on the largest shift, should be provided.



- When showers are authorized in support of physical training requirements for military personnel at remote locations without access to fitness centers, one shower for every 20 military personnel assigned should be provided.

In both cases, a ratio of 80/20 (male/female), should be used for planning purposes (ratio may go up as manning structure dictates, but not lower than 80/20). Use the guidance above to determine the number of showers required.

Planning Factor: Allocate 20 NSF/shower.

Justification: A Shower Room may be justified for commands with 24-hour, multiple shifts or remote operation requirements. If the organization is located on a large installation with access to fitness centers, shower rooms are generally not authorized except when 24-hour operations are required.

Justification should address some or all of the following factors as appropriate:

- Mission or functions performed
- Type of operations supported (normal, shift, emergency)
- Physical Training (PT) requirements at remote locations
- Total number of showers required based on guidance above
- Military personnel may require showers in support of mandatory physical fitness requirements.
- Military, civilian and/or contractor personnel may require showers in support of shift or emergency operations.
- Other justification

**131-8.3 Special Purpose Space, Security.** Security spaces for C5ISR facilities include the Entry Control Area and the Special Security Office Suite.

**131-8.3.1 Entry Control Area.** This multifunctional area provides an assembly or holding area for visitors awaiting escort, badge and pass issue and verification, and is considered the central point for ingress and egress. For unclassified facilities, this area should consist of up to two workstations, for a two-person watch, and up to 100 NSF waiting area for personnel.

For general planning purposes, facilities that have classified spaces will require larger Entry Control Area that supports two stations for a two-person watch, a waiting area that accommodates mantraps, one unisex restroom, and a waiting area. Additionally, this area should include an additional 20 NSF per every 50 personnel assigned to the organization to accommodate the transit of personnel through the Entry Control Area.

Planning Factors: For each area within the Entry Control area, allocate as follows:

- Security Entry Control Area. Allocate 1 entry control area at 100 NSF plus 20 NSF per every 50 personnel in the command.
- Secure Visitor Waiting Area. Allocate one secure waiting area at 120 NSF.

- Security Watch Station. Allocate 64 NSF per workstation (max of 2 workstations).
- Security Unisex Bathroom. Allocate one unisex bathroom at 60 NSF, allowed only if command population exceeds 500 PN in a single facility.
- Security, Other Space. Allocated as needed for other security requirements (e.g. Security Systems Monitoring). Provide appropriate Engineering Evaluation and justification.

**Justification:** Justification should address some, or all, of the following factors as appropriate:

- Mission or functions performed
- Security requirements
- Other justification

*Note: Refer to requirements for classified facilities requiring more stringent security requirements and specific design guidance such as: Open Storage Secret (OSS), Sensitive Compartmented Information Facility (SCIF), Special Access Program (SAP) and Top Secret/Sensitive Compartmented Information (TS/SCI).*

**131-8.3.2 Special Security Officer (SSO) Suite.** The SSO Suite may be required depending on the following TS/SCI classification level:

- If SCIF or SAP facilities are present
- If personnel within the command maintain clearance levels

The SSO Suite is a multifunctional area containing, but not limited to, a reception area, indoctrination area, photography area, vault, and the SSO office space. The required area varies based on the size of the command. Large commands require additional space to handle a larger volume of personnel that need to be processed. A minimum allowance of 350 NSF is provided for all commands up to 100 personnel. Medium and large sized commands are provided additional area as shown in Table 131-2.

*Note: The SSO Suite provides office area for the SSO but does not provide office space for any additional staff. SSO staff should be provided cubicle space as a part of the open office calculation, see Section 131-6. Alternatively, since the SSO office is included in this calculation, a private office should not be included in the private office calculation for the SSO.*

**Table 131-2. SSO Suite Allowances**

<b>SSO Suite Command Size</b>	<b>Total Max NSF</b>
Small (< 100 PN)	350
Med (100-500 PN)	450
Large (>500 PN)	600

131-9 **C5ISR OPERATIONS SPACE.** C5ISR Operations Spaces are areas that directly support the C5ISR mission. These areas are often contained within a separate secure space from the rest of the facility and may require entry control space and dedicated briefing/planning spaces to support highly classified missions. Although not every C5ISR facility will contain all the areas listed, the criteria are provided as a guide. An Engineering Evaluation should be used to determine the total quantity and type of workstations required and if briefing and/or planning rooms are required. Depending on the nature of the mission, the workstations may be calculated based on the number of systems, networks, or personnel assigned. These spaces are often configured by a Watch Center or Analysis Operations Workspace. See Table 131-3 for further clarification and application of the spaces.

131-9.1 **Watch Center.** The Watch Center generally operates on a shift system where personnel oversee multiple systems using multiple shifts to provide coverage up to 24 hours a day. This space may contain the following areas: Watch Floor (containing Kiosk Workstations, Watch Stander Workstations, and Watch Workstations), Command Viewing Area, and Briefing Rooms.

All allowances for Watch Floor components include circulation area to support unclassified and classified printers, shredders, display walls, and line of site area requirements (Watch Commander Workstations to the Watch Stander Workstations).

131-9.1.1 **Kiosk Workstations.** Kiosk Workstations are provided for standalone systems. The number of Kiosk Workstations required is based on the purpose and necessity of the workstations. This station is also presumed to be unmanned, but available to all personnel on watch for use as needed.

Planning Factors: Allocate 40 NSF (including circulation area) for each Kiosk Workstation that supports up to 2 networks.

Justification: Kiosk Workstations may be justified when stand-alone or separately monitored systems require separate Kiosk Workstations.

131-9.1.2 **Watch Stander Workstations.** The number of Watch Stander Workstations is based on the number of systems being monitored and the number of watch standers per shift.

Planning Factors: Allocate 60 NSF (including circulation area) for each Watch Stander Workstation that supports up to 4 networks.

Justification: Watch Stander Workstations may be provided for operational missions with watch teams.

131-9.1.3 **Watch Commander Workstation.** In addition to Watch Stander Workstations, there are also Watch Commander Workstations required for each group identified within the Watch Center. The number of Watch Commander Workstations required is based on the structure of the watch team oversight and may include a Watch Commander, Deputy Watch Commander, and under instruction Watch Commander Workstations.

Planning Factors: Allocate 100 NSF (including circulation area) for each Watch Commander Workstations that supports up to 4 networks and 4 peripherals (secure telephones and secure video conferencing systems).

Justification: Watch Commander Workstations may be provided for operations missions with watch teams.

131-9.1.4 **Command Viewing Area.** A viewing area immediately adjacent to the Watch Floor Area may be provided for the Commanding Officer and Chief of Staff, if justified. This area may be separated from the Watch Floor by a glass wall, and may be elevated to provide complete visual oversight of the Watch Floor and its associated status boards.

Planning Factors: Allocate 300 NSF for a Command Viewing Area separate from Watch Commander Workstations. This area is separated and elevated from the Watch Floor but has a direct line of site to the Watch Floor and all displays. This space must be justified based on mission requirement.

Justification: Command Viewing Area is authorized for Emergency Operations Centers (CCN 143 65) and Mission Operation Command and Control Facility (CCN 143 80). It may be provided for other category codes with additional justification to include specific mission requirement.

131-9.1.5 **Watch Center Briefing Room.** A separate briefing area with Video Teleconference (VTC) capability is also be required for planning and briefing purposes to ensure uninterrupted operations on the Watch C. This space is separate from general-purpose conferencing capabilities due to mission requirements that may require long-term utilization of the Briefing Rooms, (e.g exercises and/or crisis action response).

Planning Factors: Allocate 500 NSF for a 25-person Watch Center Briefing Room in support of watch operations. All systems and displays monitored on the Watch Floor should also be available in this space.

Justification: Watch Center Briefing Room is authorized for Emergency Operations Centers (CCN 143 65) and Mission Operation Command and Control Facility (CCN 143 80). It may be provided for other category codes with additional justification to include specific mission requirement.

131-9.2 **Analysis Operations.** Analysis Operations generally require use of multiple network systems including both unclassified and classified networks. All personnel assigned to Analysis Operations functions require a dedicated workspace that provides both privacy for independent work and teaming areas. The workstation sizing includes the workstation area and appropriate circulation areas within the Analysis Operations space to accommodate shredders, safes and a printer for each network.

131-9.2.1 Analysis **Workstations (up to 4 networks).** This workstation provides adequate space to support operations personnel that utilize up to 4 different networked systems. This workstation can accommodate multiple

classified systems that require separation from both unclassified systems and other classified systems.

Planning Factors: Allocate 90 NSF (including circulation area) for each workstation required. These workstations should support up to 4 networks of which 2 or more are classified networks and require a separation of 3 feet from each other and from unclassified networks.

Justification: Analysis Workstations (up to 4 networks) may be provided when the operations mission require staff to access more than 2 networks.

**131-9.2.2 Analysis Workstations (greater than 4 networks).** This workstation provides adequate space to support operations and personnel that utilize more than 4 different networked systems. This workstation can accommodate multiple classified systems that require separation from both unclassified systems and other classified systems.

Planning Factors: Allocate 130 NSF (including circulation area) for each workstation required. These workstations should support more than 4 networks, of which 2 or more are classified networks and require a separation of 3 feet from each other and from unclassified networks.

Justification: Analysis Workstations (greater than 4 networks) may be provided when operations missions require staff to access more than 4 networks.

**131-9.2.3 Analysis Teaming Room.** An Analysis Teaming Room provides a crisis response operations area to support operations that may last multiple days and is separate from conference room allocations due to the potential long-term operations and classified requirements that are supported.

*Note: This is not a substitute for a department conference room, which is already provided by the command conference room calculation and requires mission specific justification.*

Planning Factors: Allocate 150 NSF for a 10 PN Analysis Teaming Room.

Justification: Justification should address some, or all, of the following factors as appropriate:

- Mission or functions performed
- Organization size if more than one Analysis Teaming Room for 10 PN is required
- Other justification

Table 131-3. Analysis and Watch Center Space Types

Workstation Type	NSF	Notes
Watch Center – Kiosk	40	This workstation is composed of a single monitor and keyboard assembly. It is generally used as a hoteling station, which supports non-resident access to systems or provides access to a network not accessible to all staff members. In a Watch Center, this Kiosk is not manned, but is provided for access to systems not available at every Watch Stander's Workstation.
Watch Center – Watch Stander Workstation	60	This workstation is composed of multiple monitors and accesses up to 4 different networks or systems.
Watch Center –Watch Commander Workstation	100	This workstation has access to all networks and systems monitored by the Watch Standers and has access to at least 4 peripherals - such as secure telephones and secure video conferencing systems.
Command Viewing Area	300	The Command Viewing Area is separate from Watch Floor. This space must be justified based on mission requirement.
Watch Center - Briefing Room	500	The Watch Center Briefing Room supports planning and briefing functions and ensures uninterrupted operations on the Watch Floor.
Analysis Workstation (up to 4 networks)	90	Each workstation supports up to 4 networks of which 2 or more are classified networks and require a separation of 3 feet from each other and from unclassified networks.
Analysis Workstation (greater than 4 networks)	130	Each workstation supports greater than 4 networks of which 2 or more are classified networks and require a separation of 3 feet from each other and from unclassified networks.
Analysis Teaming Room	150	This space is separate from Conference Room allocations due to the longer-term operations that are supported. This room may be configured to host crisis response operations that may last multiple days. This space must be justified based on mission requirement. <i>Note: This room is not a substitute for a department conference room which is already provided by the Conference Room calculation.</i>

131-10 **MAINTENANCE SPACE.** Maintenance Spaces that are internal to commands providing communications and electronic equipment maintenance may be provided utilizing an Engineering Evaluation, architectural layout, or the allowances provided in Table 131-4. These areas are considered integral to the mission of the command. Communications equipment maintenance areas that support multiple commands are considered external maintenance activities and should be classified as Category Code 217 10 (Electronics and Communication Maintenance Shop). Appropriate justification should also be provided.

131-10.1. **Maintenance Area Basic Components.** Table 131-4 provides the maximum allowance for basic components found within a Maintenance Space. Quantity and composition of these components vary with mission, logistics support systems, and levels of required security; and will be determined by an on-site Engineering Evaluation.

**Table 131-4. Maintenance Area Basic Component Maximum Allowances**

Component	Max Allowance
	NSF per Component
Work Desks	60
Small Work Tables	10
Computer Tables	30
Workbenches-Full Access	96
Workbenches-Limited Access	60
Storage Lockers	18
Small Storage Lockers	10
Large Storage Shelves	40
Large Storage Cabinet	30
Parts Lockers	12
File Cabinets	10
Test Equipment Storage Cabinets	50
Test Equipment Carts	15
Bookshelves	10
Equipment Shelves	40
Equipment Staging	TBD <sup>(1)</sup>
Other (provide Description & Justification)	TBD <sup>(2)</sup>

*(1) The Equipment staging allowance is provided for C5ISR missions that fabricate or maintain large C5ISR systems and require storage and staging areas. These areas are primarily associated with NIOC Fleet Electronic Support functions, but may be justified by other missions. An Engineering Evaluation and detailed justification to include the average size and quantity of equipment maintained must be provided.*

*(2) An "Other" allowance is provided for C5ISR missions that have a unique maintenance or storage requirement. An Engineering Evaluation and detailed justification must be provided.*

131-11 **TRAINING SPACE.** Due to the nature of C5ISR functions, specialized Training Spaces are required. These activities support ongoing training for command and fleet personnel on the latest C5ISR systems, networks, or threats. Formal course programs such as those provided through Naval Education and Training Command

(NETC) learning sites should be classified as Category Code 171 10 (Academic Instruction Building) or Category Code 171 20 (Applied Instruction Building), and justified accordingly. General military training is not considered valid justification for training spaces and should not be included in the analysis to provide C5ISR Training Spaces.

131-11.1. **Training Stations.** A maximum of 20 Training Stations is provided in a training room. This training space should support the training of system upgrades, the fielding of new hardware and software, and security classifications of equipment. Training rooms that require more than 20 Training Stations require specific course justification. The exact quantity and size of training areas is determined by an Engineering Evaluation aligned to internal operations requirements. Table 131-5 provides applicable classroom types and appropriate space allocations per student station.

**Table 131-5. Classroom Type and Student Station Allowances**

<b>Classroom Type</b>	<b>Max Student Stations</b>	<b>Training Station NSF</b>
General (standard chairs and desks)	20	22
Work Desk (with CPU, keyboard, monitor)	20	40
Workbench (larger work space to support maintenance training functions)	20	60

131-12 **EQUIPMENT SPACE.** This area is provided for communications and electronic equipment mounted in racks in support of the function(s) being performed by the organization. An Engineering Evaluation is required to determine the total quantity of equipment racks required to support each network or system.

*Note: Allowances identified in the following sections provide guidelines for planning purposes when exact values are not available. In accordance with UFC 3-580-01 2-4.4.3 to support equipment refresh and future growth, rack calculations should provide 25 percent spare capacity in each rack, and one spare rack for every four utilized racks. This will provide a growth multiplier of 1.67 which affords adequate rack space to set up new or updated equipment prior to the decommissioning of older systems and future system growth.*

131-12.1. **Data Center.** Computer systems and associated components, such as telecommunications and storage systems are housed in the Data Center. This definition excludes facilities exclusively devoted to communications and network equipment (e.g., telephone exchanges and telecommunications rooms).

Data Centers act as a centralized repository, either physical or virtual, for the storage, management, processing, and dissemination of communications and information systems. Depending on the function of the command, these spaces could be the consolidated communications and information server support for the Navy or Marine Corps activities, or may support high-density legacy computing



systems that are integral to an individual command and cannot be consolidated into remote Data Centers.

**131-12.2. Communications Security Material Area.** This area supports the management and storage of Communications Security (COMSEC) material such as the Electronic Key Management System (EKMS). This area must be segregated and meet security requirements for the highest level of COMSEC material stored and consists of rack mounted equipment and workstations for personnel. An Engineering Evaluation is required to determine the total quantity of equipment racks and workstations to support a Communications Security Material Area.

**131-12.3. Commercial Services Equipment.** Also referred to as the Cable Plant Area, this area is a specialized equipment area that provides a demarcation point separating the incoming commercial communications sources from the Data Center area. This area is separated to provide controlled access without encroachment on the mission operations. It requires two-layer access, racks and cabinets with telephone lines and switches. This space is only provided when Commercial Services Equipment areas are provided directly to the facility. An average allowance of 25 percent of the Data Center size is to be used for planning purposes.

**131-12.4. Network Distribution Area.** This area consists of server racks that provide cabling and switching areas that connect operations spaces to the server area. These areas are most often required for operations that maintain additional networks above and beyond the DON Mission Networks, which include but are not limited to: Next Generation Enterprise Network (NGEN), OCONUS Navy Enterprise Network (ONE-Net), Marine Corps Enterprise Network (MCEN) and Global Network Transport (PSNet); and/or include a large watch or analysis operation area where internal distribution areas may be required to provide adequate network management and flexibility. A maximum of 15 percent of the size of the Data Center should be used for planning purposes.

Planning Factors: Although the quantity and size of Equipment Spaces will vary depending on which specific Category Code is being evaluated, the analysis will conform to the following guidance:

- An Engineering Evaluation of the equipment systems is to be used to determine the total quantity of racks required. These racks are to be positioned on a theoretical 2 ft x 4 ft grid.
- Racks should be set up in rows with an equal number of racks.
- A continuous row, with a maximum of 25 ft in length, is allowed before a safety passage must be included between columns or racks.
- The safety passage shall be a minimum of 5 ft wide and aligned to permit direct paths through the rows of racks.
- Racks should be aligned so the front and rear of the rows face each other to create cold aisles (front) and hot aisles (rear) to maximize cooling efficiency.

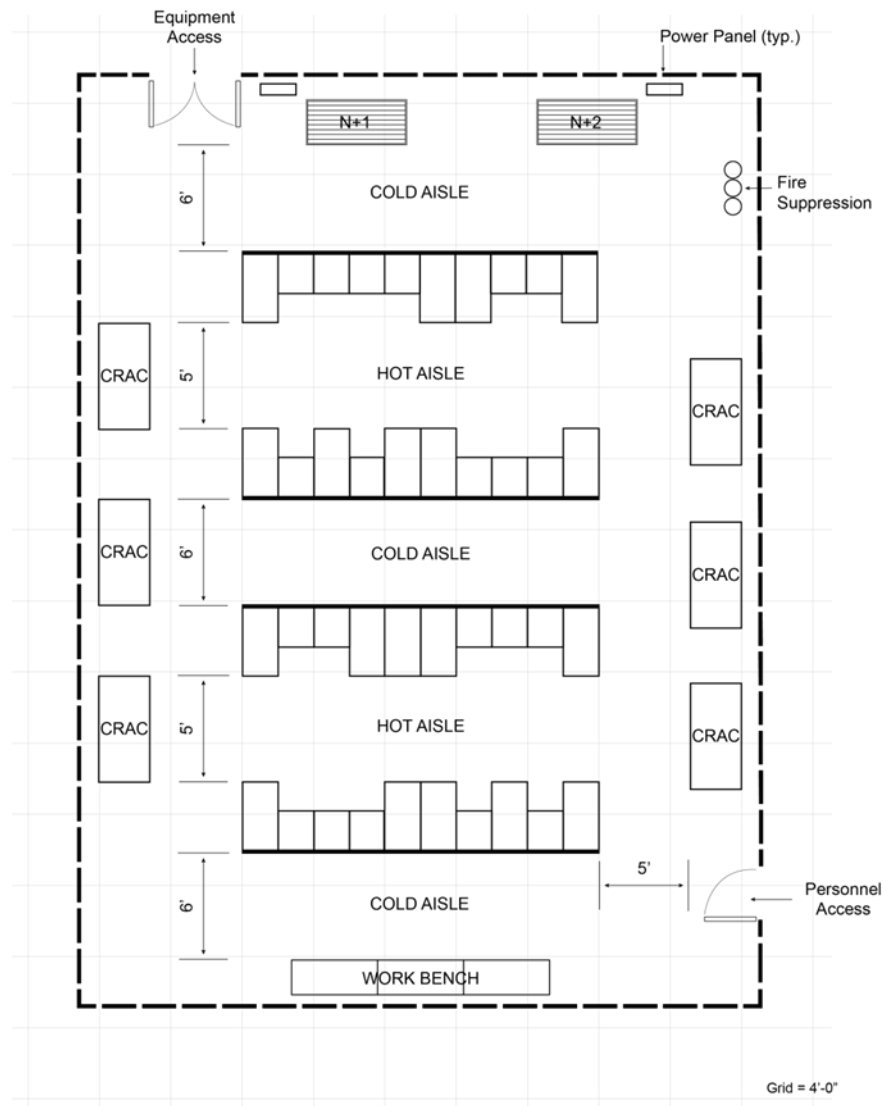
- When multiple rows of racks are required, a maximum of 6 ft is to be provided between the faces of parallel rows of racks; a maximum of 5 ft is to be provided between the backs of parallel racks; and a minimum of 5 ft is established between the end of a row and a wall. An engineering evaluation and appropriate justification is required for increased distances.
- When support devices such as electrical panels, transformers; heating, ventilation, and air conditioning (HVAC) equipment; and/or large conduit runs are surface mounted to the inside of the walls of an equipment and communications areas containing racks, the clearance requirements outlined above are to be increased by the depth of the respective support device. See Figure 131-2.
- For less than 120 total racks, the recommended server room requirements are listed in Table 131-6. For a server room with less than 10 racks, multiply the total number of racks by 45 net square feet (NSF) per rack.

**Table 131-6. Equipment Room Requirement by Total Racks**

Total Racks	Total Equipment Rows	Total Columns of Equipment	Total Equipment Room (NSF)	NSF per rack
0-10	1	1	450	45
11-20	2	1	750	38
21-30	3	1	1020	34
31-40	4	1	1320	33
41-50	5	1	1590	32
51-60	6	1	1890	32
61-80	4	2	2420	30
81-100	5	2	2610	29
101-120	6	2	2915	29
>121	To be Determined by Engineering Analysis			28

- For Data Centers that have more than 120 racks, and in the absence of a specific layout, an overall maximum of 28 NSF per rack may be used which accommodates a maximum rack size of 24 inches wide by 48 inches deep.
- Depending on the type of cooling system and cable distribution system utilized in the Data Center, a false deck (also known as a raised floor) may be required. The depth of false deck shall be determined by the system design.

Figure 131-1. Typical Layout of Equipment Mounted in Racks



*Note: Cooling redundancy within the Data Center is represented as N+1 and N+2; this represents the total number of computer room air conditioner (CRAC) units required, plus one or two extra CRAC units for back up as required. The space requirement for the CRAC units is addressed within the Data Center Mechanical & Electrical Factor found in Section 131-9.*

**131-12.5. C5ISR Equipment Room Factor.** To accommodate the significant electrical and mechanical requirements associated with facilities with large equipment rooms serving as a large Data Center or server space, this factor accounts for the additional spaces required to support the C5ISR equipment rooms that is above and beyond the requirement for the remainder of the facility. The type of mechanical systems used for cooling these types of rooms that support Data Centers and the level of redundancy required, as indicated by the Tier Level assigned to the Data Center, play key roles in the total footprint required. The Tier Level identified for a specific Data Center will dictate the redundancy requirements for each major system and is represented by N+1, N+2, 2N, etc. The general

mechanical and electrical planning factor for Data Centers and server rooms with power densities of 5kW per rack or less, are provided in Table 131-7. Additionally, once the power requirement per Data Center rack exceeds 5 kW per rack, conventional computer room air condition (CRAC) unit based mechanical systems become ineffective to meet the demand of high-density servers. In cases where the power requirement exceeds 5kW per rack or the mission criticality of the facility requires a Tier IV facility, an Engineering Evaluation is required to determine the mechanical, electrical equipment, Uninterruptable Power Source (UPS) system, and emergency generator system requirements for the facility.

**Table 131-7. C5ISR Equipment Factor**

Tier Level	Data Center Factor
I	1.56
II	2.10
III	2.28

131-13 **IT LOGISTICS SUPPORT SPACE.** A dedicated shipping, receiving, laydown/IT staging, and storage areas may be provided to support the equipment and parts storage for a command. This area is in addition to any maintenance parts and consumables storage area requirements that may also exist.

Planning Factors: IT Logistics Support space may be provided using the following Planning Factors:

- This area should be capable of supporting a refresh rate of 18-24 months plus growth due to new systems. As a general rule, assume that the space can support at least 25 percent of the equipment room racks (volume) and 15 percent of CPUs and Monitors (volume) used within the command.
- The standard stacking height for this type of material is 6 feet. A factor of 0.327 NSF per cubic foot (CF) is applied to the volume of material to determine the required NSF for this functional area.
- To calculate the shipping, receiving, and laydown/IT staging area, multiply the total NSF of storage area by a factor of 2.
- Variance from the standard stacking height or larger storage operations should be classified as Category Code 143 77 (Operational Storage) or Category Code 217 77 (Electronics Spares and Miscellaneous Procured Items and Equipment), and justified accordingly.

131-14 **NET-TO-GROSS.** Unless otherwise noted, a net-to-gross conversion factor of 1.45 is used for all CCNs within the 131 Series. This factor applies to all spaces (including the Data Center) and is required to account for the additional electrical equipment, mechanical equipment, and architectural or structural elements required to directly support the electronic and communications systems and subsystems throughout the facility.

131-15      **ASSOCIATED INFRASTRUCTURE.** Additional power and HVAC system redundancy must be provided for Tier II and Tier III facilities. For Tier II facilities: N+1 generators, N+1 Uninterruptible Power Supply (UPS) system, and N+1 HVAC components must be provided for critical areas. For Tier III facilities: N+1 generators, 2N Uninterruptible Power Supply (UPS) systems, 2N HVAC, multiple distribution paths for critical power, multiple distribution paths for cooling, and elimination of single points of failure must be provide for critical areas. Fast action fire suppression systems that do not damage equipment are also required for critical areas in Tier III facilities.

131-16      **REQUIREMENTS SUMMARY.** The functional areas authorized by right (A), authorized with justification (J), or not authorized (N) for each the following Category Codes 131 15, 131 24, 131 35, 131 40, 131 50, 143 65, and 143 80 are shown in Table 131-8.

Table 131-8 Functional Areas Summary Matrix for Communications Buildings

Functional Area	Subspace	131 15	131 24	131 35	131 40	131 50	143 65	143 80
Administrative General Purpose	Private Office	A	A	A	J	A	J	A
	Open Office (Cubicle)	A	A	A	J	A	A	A
Special Purpose Space Basic	Admin Support	A	A	A	J	A	A	A
	Break Room	A	A	J	J	J	A	A
	Break Room Kitchen	J	J	J	N	J	N	J
	Classified Vault	J	J	J	J	J	J	J
	Conference Rooms/VTC	A	A	J	J	J	A	A
	Duty/Bunk Room	J	J	J	J	J	J	J
	Mail Room	J	J	J	J	J	N	J
	Technical Publications Area	J	J	J	J	J	J	J
Special Purpose Space Fitness/Locker/ Shower	Fitness Room <sup>1</sup>	J	J	J	N	J	N	J
	Locker Room	J	J	J	N	J	J	J
	Shower Room	J	J	J	N	J	J	J
Special Purpose Space Security	Quarterdeck/Entry Control	A	A	J	J	J	J	A
	Special Security Office	J	J	J	J	J	J	J
Operations Space	Watch Center	A	A	A	J	A	A	A
	Analysis Operations	A	A	J	J	J	A	A
Maintenance Space	Maintenance	J	J	J	J	J	N	J
Training Space	Training	J	J	J	N	J	N	J
IT Logistics Support Space	IT Logistics Support Space	A	A	J	J	J	N	A
Equipment Space	Data Center/Server	A	A	N	N	N	A	A
	Commercial Services Equipment	A	A	N	N	N	N	J
	Communications Security Material Area	A	A	N	N	N	J	J
	Network Distribution Area	A	A	N	N	N	N	J
	Specialized Equipment	J	J	A	A	A	N	J

**Legend:**

A – Approved without additional justification (based on the staffing and mission requirements)

J – Only approved with specific justification of mission requirements

N – Not approved for this category code

(1). This requirement should be captured under CCN 740 45. Fitness Rooms are only allowed in accordance with CNICINST 1710.1 where by the command is located more than a 15- minute commute by vehicle from the nearest Morale Welfare and Recreation (MWR) Fitness Center, or in cases where service members are required to be on station and unable to leave for 18 hours at any given time. The fitness room must also have approval from the Installation Commanding Officer.

**131 10 CABLE HOUSE (SF)****FAC: 1311****BFR Required: Y**

13110-1 **DEFINITION.** A Cable House is an unmanned facility that functions either as an external junction point for coaxial cables, or as mechanical space for support equipment associated with Extremely Low Frequency (ELF) and Very Low Frequency (VLF) antennas. As a junction point for coaxial cables, it permits significant changes of cable direction without exceeding the bending radius limit specified by the cable manufacturer, and provides a physical access point for installation and maintenance of the cables that connect equipment areas and their respective antenna systems. The Cable House will be located within, or adjacent to, the antenna field containing ELF, VLF, Low Frequency (LF), and/or High Frequency (HF) antennas for shore to ship, and/or shore-to-shore communications.

13110-2 **FREQUENCIES.** For Very High Frequency (VHF) and/or Ultra High Frequency (UHF) systems in support of aircraft operations and tactical base support systems, a Cable House functions as a collection point that permits communication cables from multiple locations to be combined into a single path or trench that serves an single operational facility such as a Control Tower or Emergency Control Center.

13110-3 **ALLOWANCE.** Although no requirement calculations are associated with this category code, and requirements are based on an as needed basis, the maximum size of a Cable House should not exceed 27.87 GSM (300 NSF).

**131 12 COMMUNICATIONS MAINTENANCE VAULT (EA)****FAC: 8927****BFR Required: N**

13112-1 **DEFINITION.** A communications maintenance vault is a handhole, manhole, or confined space used for non-electrical splice and transport.

**131 13 COMMUNICATIONS MAINTENANCE TUNNEL (LF)****FAC: 8931****BFR Required: N**

13113-1 **DEFINITION.** This type of tunnel is an underground communications maintenance walkway accessible by personnel for communication line inspections, upgrades, and repairs below ground.

**131 15 COMMUNICATIONS, INFORMATION, OR INTELLIGENCE FACILITY (SF)****FAC: 1311****BFR Required: Y**

13115-1 **DEFINITION.** Communications, Information, or Intelligence Facilities are responsible for information processing, delivery of information services, and information/data storage. These facilities ultimately support the Joint Information Environment (JIE). The JIE/ identifies several different types of functional nodes: computing nodes (e.g. Data Centers), communication nodes (e.g. Network Gateways), and operations nodes (e.g. Enterprise Operation Centers). These nodes should be viewed as functional enclaves, not separate facilities; in fact, multiple nodes and node types may be present in a single physical facility. For further understanding of the different functional nodes refer to *DoD Information Enterprise Architecture, Data Center Reference Architecture Version 1.10 Final April 25, 2014 Table 1 and Table 2.*

13115-2 **FUNCTION TYPES.** Table 13115-1 provides a list of typical functions and sample commands that apply to this category code.

**Table 13115-1. Function Types and Sample Organizations**

Function Type	Sample Organizations
Data Center or Server Center (Only)	Any
Communications Center	Naval Computer and Telecommunications Station (NCTS), Naval Computer and Telecommunications Master Area Station (NCTAMS), etc.
Weather Center	Fleet Weather Centers (FWC), Joint Typhoon Warning Center (JTWC), etc.
Information and Intelligence Commands	NIOC, Navy Information Operations Division (NIOD), Navy Cyber Defense Operations Command (NCDOC), Navy Information Warfighting Development Center (NIWDC), Naval Network Warfare Command (NNWC), etc.

13115-2 **FUNCTION AREAS.** A Communications, Information, or Intelligence Facility may contain the functional areas shown in Table 13115-2. This facility will be supported by an Uninterruptible Power Supply (UPS) system and emergency generator system. Please refer to the guidelines provided in the introduction of 131-series Category Codes for C5ISR buildings to calculate the requirement for each functional area. Per section 131-14, the authorized **net-to-gross** factor is 1.45.



**Table 13115-2. Communications, Information, or Intelligence Facility  
Functional Areas**

<b>Functional Area</b>	<b>Subspace</b>	<b>131 15</b>
Administrative General Purpose	Private Office	A
	Open Office (Cubicle)	A
Special Purpose Space Basic	Admin Support	A
	Break Room	A
	Break Room Kitchen	J
	Classified Vault	J
	Conference Rooms/VTC	A
	Duty/Bunk Room	J
	Mail Room	J
	Technical Publications Area	J
Special Purpose Space Fitness/Locker/ Shower	Fitness Room <sup>1</sup>	J
	Locker Room	J
	Shower Room	J
Special Purpose Space Security	Quarterdeck/Entry Control	A
	Special Security Office	J
Operations Space	Watch Center	A
	Analysis Operations	A
Maintenance Space	Maintenance	J
Training Space	Training	J
IT Logistics Support Space	IT Logistics Support Space	A
Equipment Space	Data Center/Server	A
	Commercial Services Equipment	A
	Communications Security Material Area	A
	Network Distribution Area	A
	Specialized Equipment	J

**Legend:**

A – Approved without additional justification (based on the staffing and mission requirements)

J – Only approved with specific justification of mission requirements

(1). This requirement should be captured under CCN 740 45. Fitness Rooms are only allowed in accordance with CNICINST 1710.1 where by the command is located more than a 15- minute commute by vehicle from the nearest Morale Welfare and Recreation (MWR) Fitness Center, or in cases where service members are required to be on station and unable to leave for 18 hours at any given time. The fitness room must also have approval from the Installation Commanding Officer.

13115-4 **SPACE DISTRIBUTION.** A Communications, Information, or Intelligence Facility will generally consist of the functional space types shown in Table 13115-3: General Administrative and Special Purpose Space, C5ISR Operations (watch/analysis) Space, Maintenance Space, Training Space, Equipment Space (racked equipment area, often called a Data Center or server area), and IT Logistics Space. The

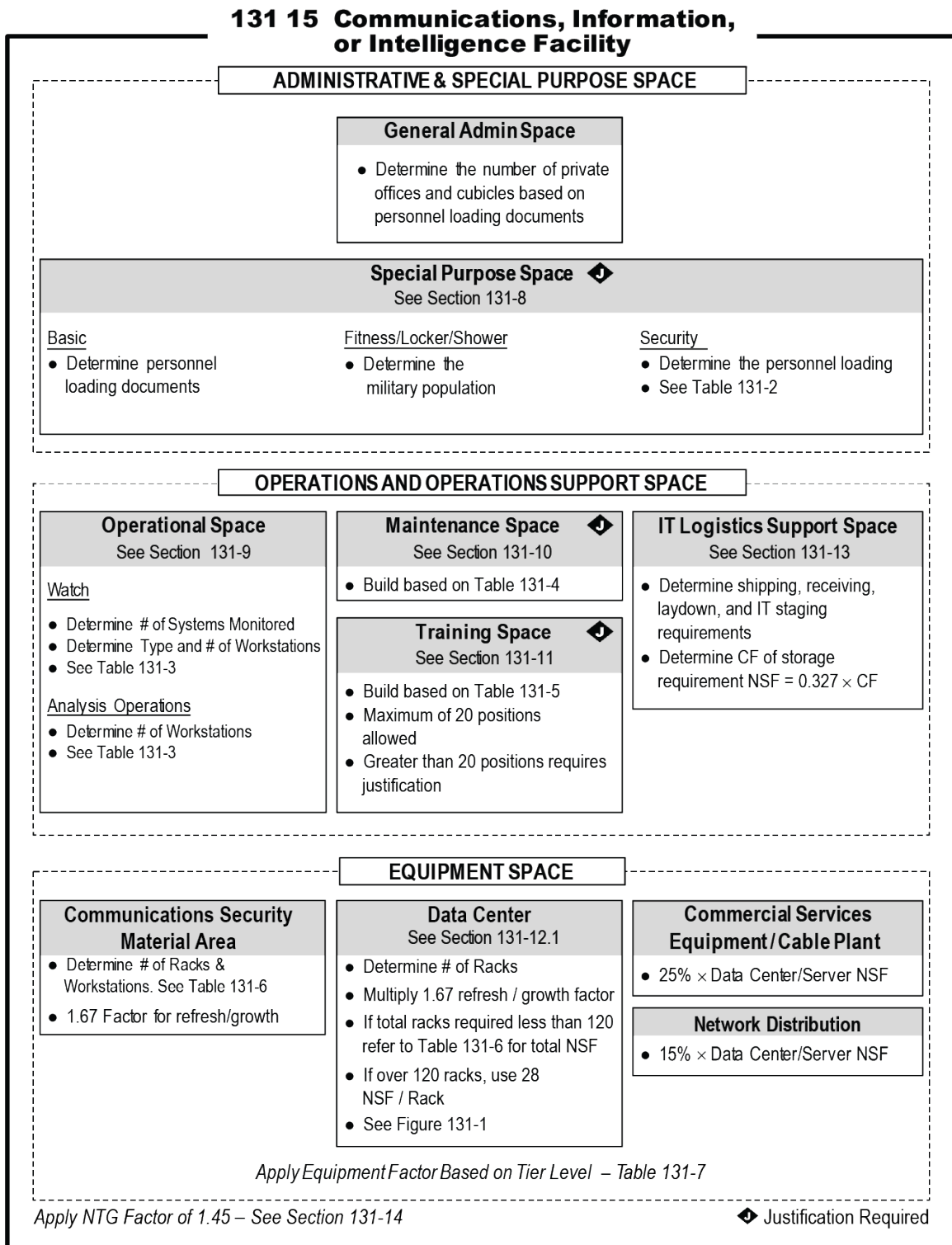
percentages shown in Table 13115-3 provide a guide of the general size of these areas in relation to the overall facility. For instance, a stand-alone Data Center would likely be made up of 75 percent Equipment Space; 20 percent of General Administrative and Special Purpose Space, C5ISR Operations Space, Maintenance Space, and Training Space; and 5 percent IT Logistics Space.

**Table 13115-3 Function Type and Space Type Distribution**

Function Type	General Admin & Special Purpose	C5ISR Operations	Maintenance	Training	Equipment	IT Logistics
Data Center/Server Space (Only)	20%				75%	5%
Communications Center	25%	15%	5%	5%	45%	5%
Weather Center	34%	40%	n/a	1%	20%	5%
Information Analysis Center	30%	35%	n/a	5%	20%	5%

13115-4 **BUILDING BLOCKS.** Figure 13115-1 provides a diagram demonstrating a summary of the applicable spaces, appropriate allocation factors, and the special relationship for Communications, Information, and/or Intelligence Facilities.

**Figure 13115-1. Communications, Information, or Intelligence Facility Building Blocks Diagram**



**131 17 COMMUNICATIONS MAINTENANCE CHANNEL (LF)**  
**FAC: 8932**  
**BFR Required: N**

13117-1 **DEFINITION.** This type of facility is an underground communications maintenance channel accessible via ground level access panels to allow inspections, upgrades, and repairs to communication lines below ground.

**131 20 COMMUNICATIONS RELAY FACILITY (SF)**  
**FAC: 1311**  
**BFR Required: Y**

13120-1 **DEFINITION.** A Communications Relay Facility is an unmanned facility or enclosure associated with the operation of Microwave (MW) communications systems. It contains rack mounted communications receiving, amplification, and transmitting equipment, along with an Uninterruptible Power Source (UPS) system and an emergency generator system. A Communications Relay Facility can be a permanent facility, but unless location and atmospheric conditions dictate otherwise, it is normally Class III Property. It is located at the base of the antenna tower that contains the associated microwave dishes. The size of the facility or enclosure is dependent on the number of microwave links be served by the antenna tower and by the quantity of commercial equipment (cell phone) systems that DON has authorized. See Table 13120-1.

**Table 13120-1 Allowances**

<b>Facility Size</b>	<b>Description</b>	<b>Allowance</b>
Small Facility	Two Microwave Links with no commercial tenants	16 GSM (172 GSF)
Medium Facility	Three or more Microwave Links with no commercial tenants	20 GSM (215 GSF)
Large Facility	Three or more Microwave Links with multiple commercial tenants	22 GSM (237 GSF)

**131 22 VHF/UHF COMMUNICATIONS FACILITY (SF)**  
**FAC: 1311**  
**BFR Required: Y**

13122-1 **DEFINITION.** A VHF/UHF Communications Facility can either be contained within a permanent facility or within Class III Property. It contains a limited amount of rack mounted communications receiving, amplification, and transmitting equipment associated with Airfield Operations, Security and Fire Operations, or a tactical Communications system integral to unique special operations. A small

Uninterruptible Power Source (UPS) system and an emergency generator system support a VHF/UHF Communications Facility.

13122-2 **Allowance.** Although no requirement calculations are associated with this Category Code, and requirements are based on an as needed basis, the maximum size of a VHF/UHF Communications Facility should not exceed 41.81 GSM (450 NSF).

## **131 24 SATELLITE COMMUNICATIONS FACILITY (SF)**

**FAC: 1312**

**BFR Required: Y**

13124-1 **DEFINITION.** Satellite Communications Facility is often referred to as a 'gateway facility' supporting Worldwide, Regional, and Area of Responsibility (AOR) communications. It contains office and support requirements, equipment and operations areas, maintenance and training areas, and limited storage areas for ready-to-issue communications systems and subsystems required for the reception, processing, routing, and dissemination of incoming and outgoing communications traffic.

13124-2 **ANTENNAS.** The receiving/transmitting antennas systems associated with this facility are directional in nature. Antennas that are in excess of 3 meters in diameter are mounted, in most cases, on a dedicated tower or support structure that is integral to the antenna. In selected instances, the functional equipment associated with a Satellite Communications Facility may be located within a Communications, Information, Or Intelligence Facility (131 15), and thus this Category Code should be used only where 'stand-alone' facilities are being evaluated.

13124-2 **FUNCTIONAL AREAS.** A Satellite Communications Facility may contain the functional areas shown in Table 13124-1. This facility will be supported by an Uninterruptible Power Support (UPS) system and emergency generator system. Please refer to the guidelines provided in the introduction of 131-series Category Codes for C5ISR buildings to calculate the requirement for each functional area. Per section 131-14, the authorized **net-to-gross** factor is 1.45.

13124-3 **BUILDING BLOCKS.** Figure 13124-1 provides a diagram demonstrating a summary of the applicable spaces, appropriate allocation factors, and the special relationship for Satellite Communications Facilities.

**Table 13124-1. Satellite Communications Facility Functional Areas**

<b>Functional Area</b>	<b>Subspace</b>	<b>131 24</b>
Administrative General Purpose	Private Office	A
	Open Office (Cubicle)	A
Special Purpose Space Basic	Admin Support	A
	Break Room	A
	Break Room Kitchen	J
	Classified Vault	J
	Conference Rooms/VTC	A
	Duty/Bunk Room	J
	Mail Room	J
	Technical Publications Area	J
Special Purpose Space Fitness/Locker/ Shower	Fitness Room <sup>1</sup>	J
	Locker Room	J
	Shower Room	J
Special Purpose Space Security	Quarterdeck/Entry Control	A
	Special Security Office	J
Operations Space	Watch Center	A
	Analysis Operations	A
Maintenance Space	Maintenance	J
Training Space	Training	J
IT Logistics Support Space	IT Logistics Support Space	A
Equipment Space	Data Center/Server	A
	Commercial Services Equipment	A
	Communications Security Material Area	A
	Network Distribution Area	A
	Specialized Equipment	J

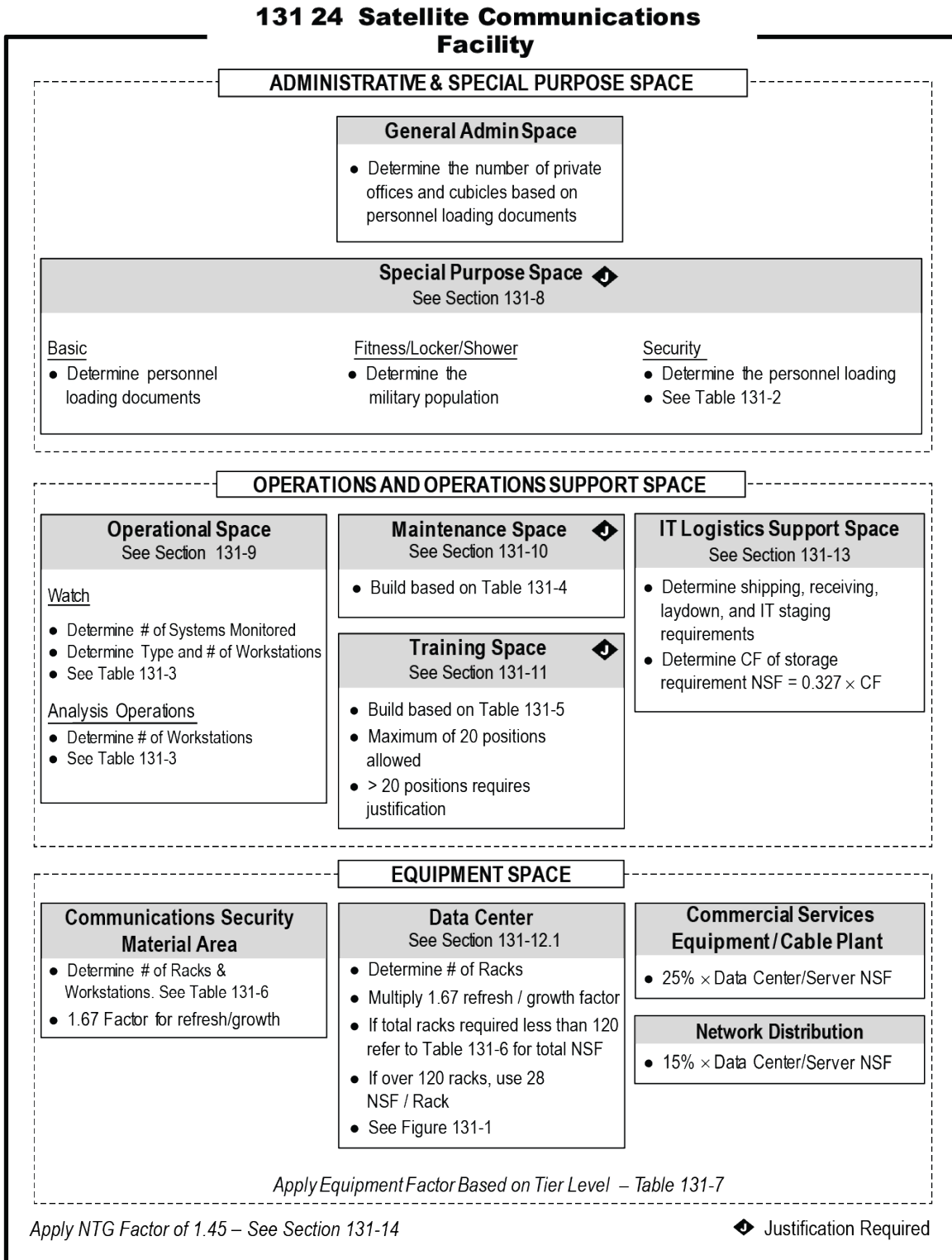
**Legend:**

*A – Approved without additional justification (based on the staffing and mission requirements)*

*J – Only approved with specific justification of mission requirements*

*(1). This requirement should be captured under CCN 740 45. Fitness Rooms are only allowed in accordance with CNICINST 1710.1 where by the command is located more than a 15- minute commute by vehicle from the nearest Morale Welfare and Recreation (MWR) Fitness Center, or in cases where service members are required to be on station and unable to leave for 18 hours at any given time. The fitness room must also have approval from the Installation Commanding Officer.*

**Figure 13124-1. Satellite Communications Facility Building Blocks Diagram**



**131 25 TELEMETRY BUILDING (SF)****FAC: 1311****BFR Required: Y**

13125-1 **DEFINITION.** A Telemetry Building is an extremely specialized and unique facility specifically designed for the tracking of missiles and satellites. It can be a permanent facility, or configured as a mobile asset within Class III property. As a permanent facility, it will contain equipment areas for transmitters, receivers, and recorders and personnel areas for operators and staff support elements. The size of equipment areas will be dependent upon the quantity of mission specific arrays of tracking antennas and communications interfaces. Personnel, support, maintenance, and logistics support requirements will be dependent on the infrastructure of the Shore Activity with which the Telemetry Building is collocated and will require an Engineering Analysis. If configured within Class III property, a maximum of three fifty-foot by twelve-foot vans are standard for the support of equipment, operations, and logistics spaces.

**131 30 HELIX HOUSE (SF)****FAC: 1311****BFR Required: Y**

13130-1 **DEFINITION.** A Helix House contains a Helical Coil and associated antenna tuning devices directly associated with, and integral to, the transmission of Low Frequency (LF), Very Low Frequency (VLF), and Extremely Low Frequency (ELF) communications.

13130-2 It is an unmanned facility, and is located within an antenna field associated with a Transmitter Building (Category Code 131 50). It is connected to a Transmitter Building by a cable trench, which contains power and signal cables. The Helix house is positioned adjacent to its respective antenna system.

13130-3 The size of a Helix House is totally dependent on the output power and operating frequency of the LF, VLF, or ELF transmitter located within the Transmitter Building. Although some AN/FRT-72 LF transmitters remain in the DON inventory, the AN/FRT-95 is the current generation of LF transmitters. An allowance of 342nsm (3,681nsf) is provided for a Helix House in support of the AN/FRT-95. VLF and ELF transmitters, which operate in the less than 30Kc range, are special manufacture units. Mission and location of the Transmitter Building, and coverage within a specific Area of Operation determine frequency and power. An allowance of 439nsm (4,725nsf) is normally provided for a Helix House in support of VLF and ELF transmitters.

**131 35 RECEIVER BUILDING (SF)****FAC: 1311****BFR Required: Y**

13135-1 **DEFINITION.** A Receiver Building supports a 24-hour a day, 7-day a week operations requirement for shore to shore and ship to shore administrative, tactical, and



strategic High Frequency (HF) communications. This building may also be used to support transceivers, which are capable of both receiving and transmitting. *Note: if the transmitting only equipment is required, please refer to category code 131 50 Transmitter Building.*

The Receiver Building contains an equipment area with racked receivers and interface equipment, a maintenance area, and a storage area containing a small quantity of spare parts. A small personnel support space containing a toilet facility and break area is considered part of the facility. An Uninterruptible Power Source (UPS) system and an emergency generator system support a Receiver Building.

13135-2 **LOCATION.** The Receiver Building is physically located near the center of the receive antenna field, and it is connected to all antennas via direct buried coaxial cables. Location requirements for a Receiver Building and its associated antenna field with respect to possible areas of interference are provided in Table 13135-1 below.

**Table 13135-1. Communications Distance Separations**

<b>From any High Frequency Antenna at a Receiver Site to:</b>	
Navy Very Low Frequency (VLF) Transmitter Buildings	25 miles
Navy Low Frequency and High Frequency Transmitter Buildings	15 miles
Transmitting Facilities Not Under Navy Control	5 miles
Runways and Guide Paths Aeronautical Receivers	1,500 feet
General Communications Receivers	5 miles
Main Highways (hourly traffic count over 1,200 vehicles)	3,000 feet
Overhead High Tension Power Lines to include Receiver Station Feeders less than 100KV	1,000 feet
Overhead High Tension Power Lines to include Receiver Station Feeders over 100KV	2 miles
Residential Areas Not Under Navy Control	1 mile
Light Industry	3 miles
Heavy Industry	5 miles
Primary Power Plants	5 miles

13135-3 **FUNCTIONAL AREAS.** A Receiver Building may contain the functional areas shown in Table 13135-2. In instances where the Receiver Building is located in an isolated location, and thus not readily supported by the staff of the associated Communications, Information, or Intelligence Facility (131 15), additional personnel

support functions may be justified with appropriate documentation. These areas may include Conference Room, Break Room Kitchen, Locker Rooms, Shower Rooms, Duty/Bunk Rooms etc. This facility may also be supported by an Uninterruptible Power Support (UPS) system and emergency generator system. Please refer to the guidelines provided in the introduction of 131-series Category Codes for C5ISR buildings to calculate the requirement for each functional area. Per section 131-14, the authorized **net-to-gross** factor is 1.45.

See Table 13135-2 for additional spaces allowed with justification. In some instances, functions performed by a Receiver Building are an integral part of a Communications, Information, or Intelligence Facility (131-15), thus this Category Code should be used only where 'stand-alone' facilities are being evaluated.

**Table 13135-2. Receiver Building Functional Areas**

Functional Area	Subspace	131 35
Administrative General Purpose	Private Office	A
	Open Office (Cubicle)	A
Special Purpose Space Basic	Admin Support	A
	Break Room	A
	Break Room Kitchen	J
	Conference Rooms/VTC	J
	Duty/Bunk Room	J
Special Purpose Space Fitness/Locker/ Shower	Fitness Room <sup>1</sup>	J
	Locker Room	J
	Shower Room	J
Special Purpose Space Security	Quarterdeck/Entry Control	J
Operations Space	Watch Center	J
	Analysis Operations	J
Maintenance Space	Maintenance	A
Training Space	Training	J
IT Logistics Support Space	IT Logistics Support Space	A
Equipment Space	Data Center/Server	A
	Specialized Equipment	A

**Legend:**

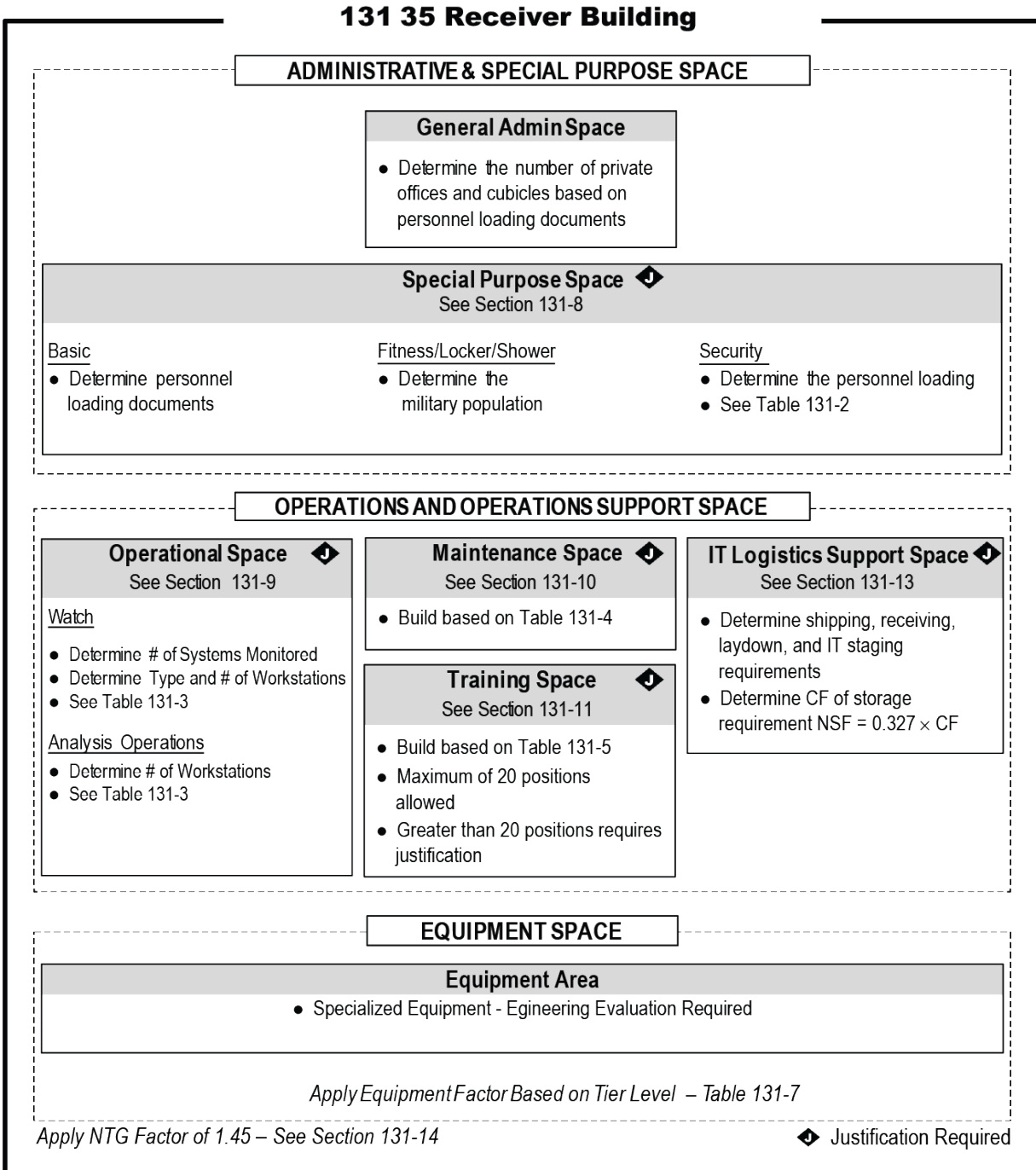
A – Approved without additional justification (based on the staffing and mission requirements)

J – Only approved with specific justification of mission requirements

(1). This requirement should be captured under CCN 740 45. Fitness Rooms are only allowed in accordance with CNICINST 1710.1 where by the command is located more than a 15- minute commute by vehicle from the nearest Morale Welfare and Recreation (MWR) Fitness Center, or in cases where service members are required to be on station and unable to leave for 18 hours at any given time. The fitness room must also have approval from the Installation Commanding Officer.

13135-4 **BUILDING BLOCKS.** Figure 13135-1 provides a diagram demonstrating a summary of the applicable spaces, appropriate allocation factors, and the special relationship for Receiver Buildings.

**Figure 13135-1. Receiver Building Building Blocks Diagram**



**131 40 TELECOMMUNICATIONS DISTRIBUTION FACILITY (SF)****FAC: 1311****BFR Required: Y**

13140-1 **DEFINITION.** A Telecommunications Distribution Facility is a dedicated facility that supports the distribution of telecommunications systems across Navy Installations and Regions. This facility is often unmanned or has limited space for support staff. This type of facility contains the telecommunications switches and distribution frames. It may also contain the incoming demarcation point for commercial services or support the outside cable plant services for an installation or a special area. The facility is supported by Uninterruptible Power Source (UPS) systems and emergency generator systems, and may use a combination of hard wire, microwave, and satellite system to interface with the commercial providers. The receiving/transmitting antennas are normally commercial units and are directional in nature. The antennas are mounted on a dedicated tower or support structure immediately adjacent to the equipment they support. In many instances the telecommunications systems and their respective antennas are an integral part of a Communications, Information, or Intelligence Facility (Category Code 131 15). This Category Code (131 40) should only be used where 'stand-alone' facilities are being evaluated.

13140-2 **FUNCTIONAL AREAS.** A Telecommunications Distribution Facility may contain the functional areas shown in Table 13140-1. This facility may be supported by an Uninterruptible Power Supply (UPS) system and emergency generator system. Please refer to the guidelines provided in the introduction of 131-series Category Codes for C5ISR buildings to calculate the requirement for each functional area. Per section 131-14, the authorized **net-to-gross** factor is 1.45.

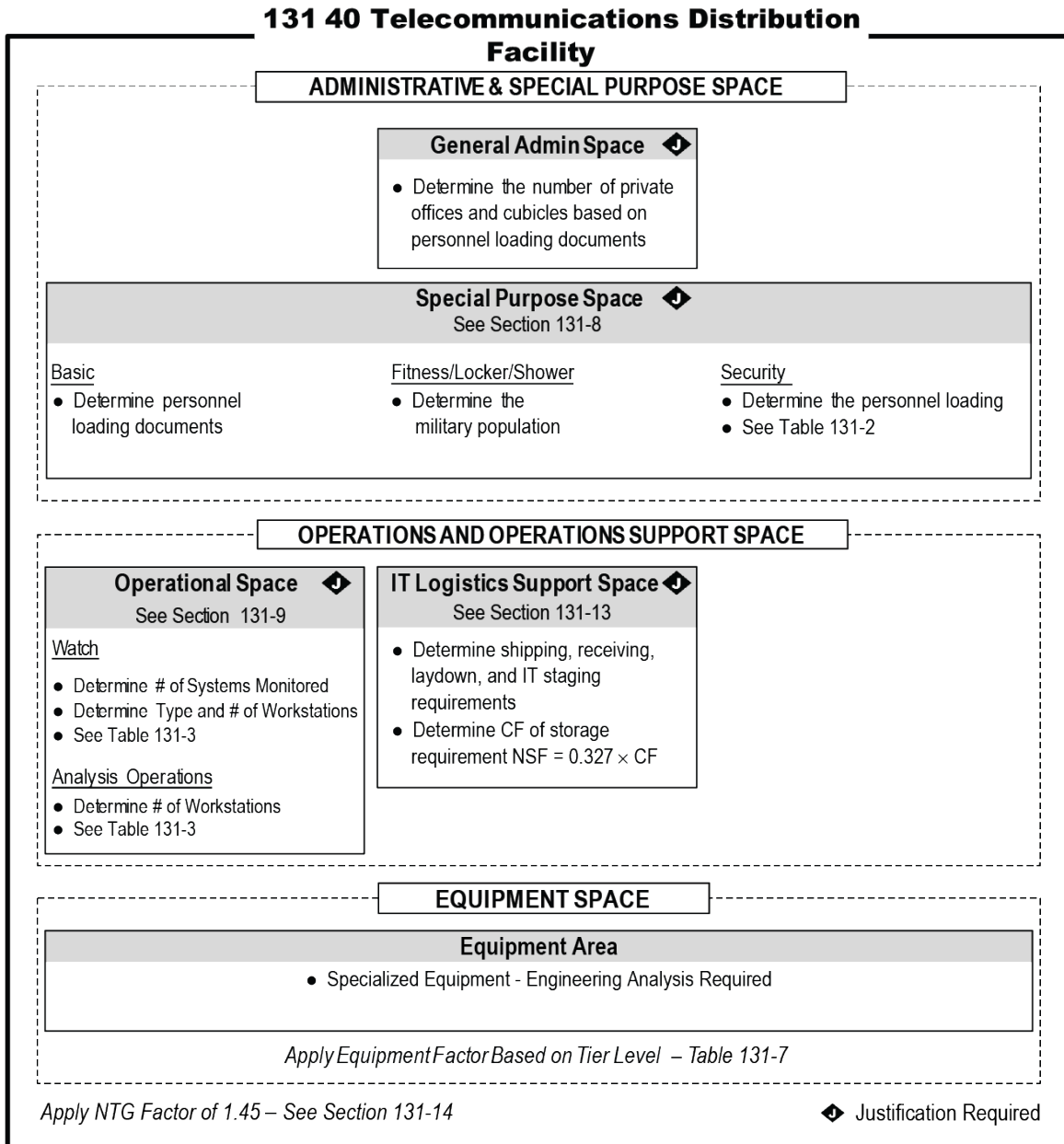
13140-3 **BUILDING BLOCKS.** Figure 13140-1 provides a diagram demonstrating a summary of the applicable spaces, appropriate allocation factors, and the special relationships for Telecommunications Distribution Facility.

**Table 13140-1. Telecommunications Distribution Facility Functional Areas**

<b>Functional Area</b>	<b>Subspace</b>	<b>131 40</b>
Administrative General Purpose	Private Office	J
	Open Office (Cubicle)	J
Special Purpose Space Basic	Admin Support	J
	Break Room	J
	Classified Vault	J
	Conference Rooms/VTC	J
	Duty/Bunk Room	J
	Mail Room	J
	Technical Publications Area	J
Special Purpose Space Security	Quarterdeck/Entry Control	J
	Special Security Office	J
Operations Space	Watch Center	J
	Analysis Operations	J
IT Logistics Support Space	IT Logistics Support Space	J
Equipment Space	Specialized Equipment	A

*Legend:**A – Approved without additional justification (based on the staffing and mission requirements)**J – Only approved with specific justification of mission requirements*

**Figure 13140-1. Telecommunications Distribution Facility Building Blocks Diagram**



**131 42 AUTOMATIC COMMUNICATIONS SWITCHING CENTER (SF)****FAC: 1311****BFR Required: Y**

13142-1 An Automatic-Communications Switching Center identifies a facility that contains the Telephone Switch and its immediate support infrastructure. Although it is possible that some isolated examples of this configuration may still exist, the current communications architecture for this equipment places it within a Telecommunications Distribution Facility (Category Code 131 40).

Use for Inventory Purposes only.

**131 45 TERMINAL EQUIPMENT BUILDING (SF)****FAC: 1311****BFR Required: Y**

13145-1 This facility originally, and currently to a minor extent, performs as a single-function building that is in direct support of High Frequency (HF) or Low Frequency (LF) communications. It provides an intermediate connection point that is required technically to support communications configuration, or is required as the result of waveguide or cable loss.

13145-2 A Terminal Equipment Building is also the designation currently given to a new generation of facilities associated with satellite equipment and the selected equipment in support of the satellite antenna. It is commonly referred to as an equipment shelter and can be located within the pedestal base of the antenna or in a separate enclosure immediately adjacent to the base of the antenna. This new generation facility is Class III property in most instances. Although the antenna is classified as a structure, this Category Code is appropriate for 'stand-alone' configurations.

**131 50 TRANSMITTER BUILDING (SF)****FAC: 1311****BFR Required: Y**

13150-1 **DEFINITION.** A Transmitter Building supports a 24 hour a day, 7 day a week operations requirement for shore to shore, and shore to ship administrative, tactical, and strategic High Frequency (HF), Low Frequency (LF), and Very Low Frequency (VLF) communications. It contains an equipment area with stand-alone and racked transmitters, as well as their associated interface equipment, a maintenance area, and a storage area containing a small quantity of spare parts. A small personnel support space containing a toilet facility and break area is considered part of the facility. The Transmitter Building is physically located near the center of the transmit antenna field, and is connected to all antennas via direct buried coaxial cables for HF applications, or by a dedicated power and signal trench for LF and VLF applications. Due to the variable nature of transmitter equipment, an Engineering Evaluation is required to calculate the equipment and operations space requirements.

13150-2 **DISTANCE SEPARATIONS.** A specific Transmitter Building will support one of the following: HF only, HF and LF, VLF only, or ELF only operations. Location requirements for a Transmitter Building and its associated antenna field, with respect to possible areas of interference, are provided in Table 13150-1 below. An Uninterruptible Power Source (UPS) system and an emergency generator system support a Transmitter Building.

**Table 13150-1. Communications Distance Separations**

<b>From the Nearest High Frequency, HF/LF/VLF/ELF Antenna Supporting a Transmitter Site to:</b>	
Transmitting Facilities Not Under Navy Control	5 miles
Runways and Guide Paths Aeronautical Transmitters	1,500 feet
Main Highways (hourly traffic count over 1,200 vehicles)	1,000 feet
Overhead High Tension Power Lines to include transmitter station feeders	1,000 feet

13150-3 **FUNCTIONAL AREAS.** A Transmitter Building may contain the functional areas shown in Table 13150-2. This facility may be supported by an Uninterruptible Power Supply (UPS) system and emergency generator system. To calculate the area required to support the specialized equipment associated with each type of transmitter, an Engineering Evaluation is required. Specific requirements may be classified; therefore proper security clearance is required to obtain the information.

Please refer to the guidelines provided in the introduction of 131-series Category Codes for C5ISR buildings for additional information to calculate the requirement for other standard functional areas. Per section 131-14, the authorized **net-to-gross** factor is 1.45.



**Table 13150-2. Transmitter Building Functional Areas**

<b>Functional Area</b>	<b>Subspace</b>	<b>131 50</b>
Administrative General Purpose	Private Office	A
	Open Office (Cubicle)	A
Special Purpose Space Basic	Admin Support	A
	Break Room	J
	Break Room Kitchen	J
	Classified Vault	J
	Conference Rooms/VTC	J
	Duty/Bunk Room	J
	Mail Room	J
	Technical Publications Area	J
Special Purpose Space Fitness/Locker/Shower	Fitness Room <sup>1</sup>	J
	Locker Room	J
	Shower Room	J
Special Purpose Space Security	Quarterdeck/Entry Control	J
	Special Security Office	J
Operations	Watch Center	A
	Analysis Operations	J
Maintenance	Maintenance	J
Training	Training	J
IT Logistics Support Space	IT Logistics Support Space	J
Equipment	Specialized Equipment	A

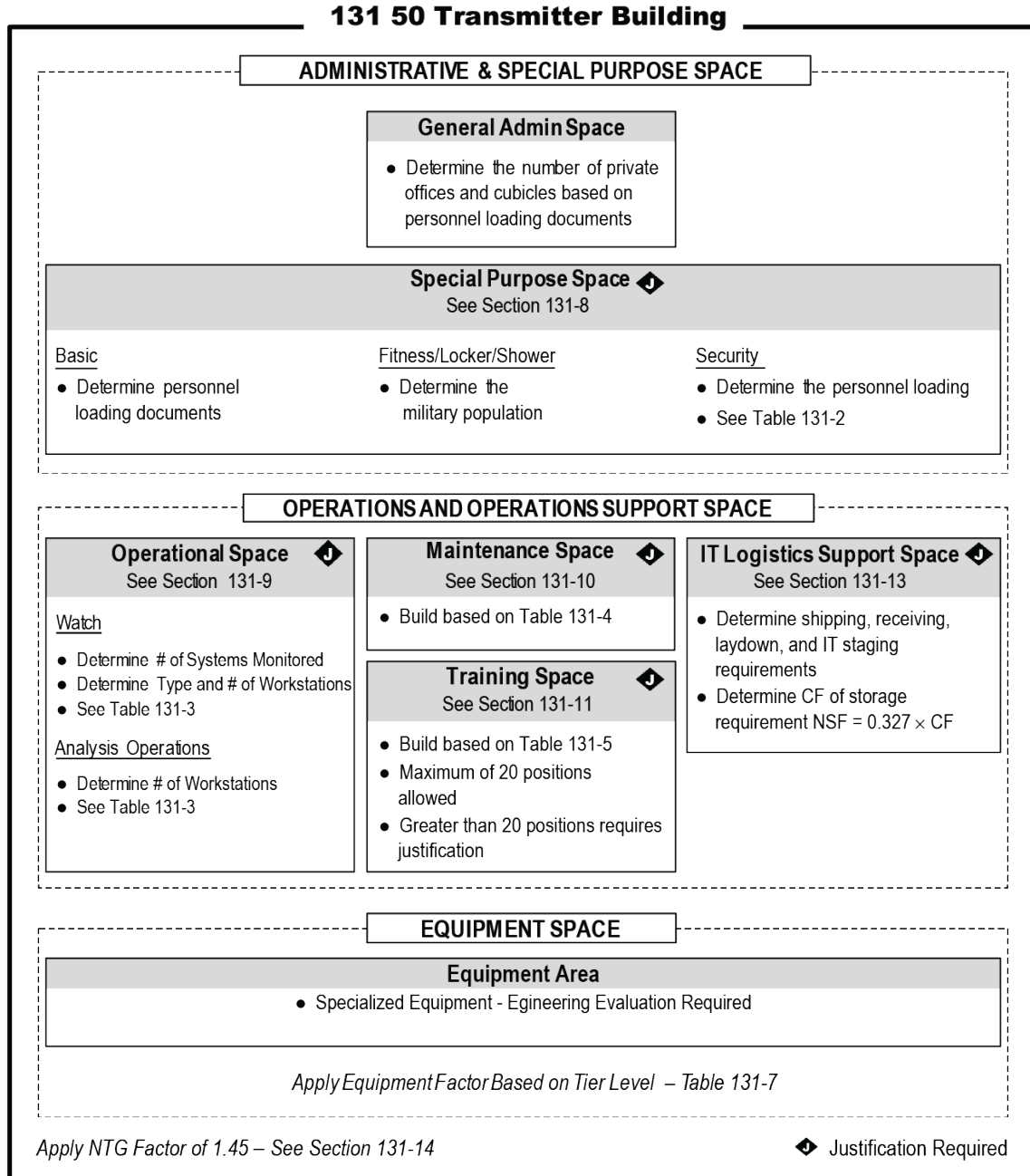
**Legend:**

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*J – Only approved with specific justification of mission requirements*

*(1). This requirement should be captured under CCN 740 45. Fitness Rooms are only allowed in accordance with CNICINST 1710.1 where by the command is located more than a 15- minute commute by vehicle from the nearest Morale Welfare and Recreation (MWR) Fitness Center, or in cases where service members are required to be on station and unable to leave for 18 hours at any given time. The fitness room must also have approval from the Installation Commanding Officer.*

**Figure 13150-1. Transmitter Building Building Blocks Diagram**



**131 55 CIRCULARLY DISPOSED ANTENNA ARRAY BUILDING (SF)****FAC: 1311****BFR Required: N**

13155-1 **DEFINITION.** A Circularly Disposed Antenna Array (CDAA) Building is a High Frequency Direction Finding (HFDF) facility that contains the tuning and receiving equipment associated with the AN/FRD-10 antenna. Category Code 131 55 is specific to Naval Security Group Activity (NSGA) locations. It is a technical and operational requirement that the CDAA building be located within the center of the AN/FRD-10 array. The AN/FRD-10, commonly referred to as a Wullenweber antenna, requires specific siting criteria as outlined in NSGINST 2450.1. The CDAA building also contains staff and personnel support spaces, maintenance and training spaces, and storage spaces.

13155-2 The Department of Navy no longer maintains a HFDF mission. As a result, Circularly Disposed Antenna Array Buildings contained within inventory are in the process of being demolished, or are have been converted for use in other category codes. Category Code 131 55 is provided for information purposes only.

**131 56 DIRECTION FINDER BUILDING (SF)****FAC: 1311****BFR Required: N**

13156-1 **DEFINITION.** A Direction Finder Building is a High Frequency Direction Finding (HFDF) facility that contains the tuning and receiving equipment associated with the AN/FRD-13 antennas. It is associated with functions performed by various DON Communications, Intelligence, and Operational missions. Unlike the CDAA (131-55), the Direction Finder Building is not located within the center of the AN/FRD-13 array, and it contains very limited personnel support space, maintenance space, and storage space. The AN/FRD-13 requires specific siting criteria as outlined in NSGINST 2450.1.

13156-2 DON no longer maintains a HFDF mission. As a result, Direction Finder Buildings contained within inventory are in the process of being demolished, or are have been converted for use in other category codes. Category Code 131 56 is provided for information purposes only and should not be used.

**131 60 MILITARY AFFILIATE RADIO STATION (MARS) (SF)****FAC: 1311****BFR Required: N**

13160-1 This category code is for inventory purposes only until the function is either absorbed into Category Code 131 15 or is eliminated completely and facilities are reassigned to other functions.

**131 65 COMMUNICATIONS ANALYSIS FACILITY (SF) [DELETE]****FAC: 1311****BFR Required: Y**

13165-1 This category is deleted. All future requirements should be reassigned and revised to Category Code 13115 "Communications, Information, or Intelligence Analysis Facility."

**132 COMMUNICATIONS-OTHER THAN BUILDINGS**

132-1 This facility group encompasses radio antennas, switching stations and public address systems. The antennas required are a function of the number and type of radio circuits to be incorporated in the communications system.

**132 10 ANTENNA-COMMUNICATIONS (EA)****FAC: 1321****BFR Required: N**

13210-1 Planning for communications antennas involves consideration of three basic aspects: siting, selection of types, and structures for support.

13210-2 Requirements for siting, arrangements, types of antennas, circuitry, and other aspects, are determined by the Space and Warfare Systems Command (SPAWAR) and the office having support responsibility. The antenna types and their heights are:

Uniform lattice (guyed)	to 1500 feet
Uniform lattice (self-supporting)	to 600 feet
Pole	to 220 feet

13210-3 Vertical radiators make use of the tower structure as the radiator. The SPAWAR Systems Command provides the electronic specifications for vertical radiator antennas. The Naval Facilities Engineering Command provides the structural design.

13210-4 The majority of antenna installations used at radio communications facilities are tower/pole and wire construction. These are:

- Antenna system supported between self-supporting or guyed towers, transmitting/receiving
- Vertical radiator, transmitting only
- Rhombic, transmitting/receiving
- Tilted folded doublet transmitting/receiving
- Vee, transmitting/receiving
- Horizontal LF, transmitting/receiving

- Vertical doublet transmitting/receiving
- Horizontal parasitic doublet, transmitting/receiving
- Horizontal two-wire doublet, transmitting only
- Horizontal three-wire doublet, transmitting only
- Various UHF and VHF antennas
- Rotatable log periodic, transmitting/receiving (tower supported)
- Horizontal log periodic, transmitting/receiving (tower supported)
- Vertical log periodic, transmitting/receiving (tower supported)
- Conical monopole, transmitting/receiving (tower supported)
- Discone, transmitting/receiving
- Inverted cone, transmitting/receiving
- Wire grid lens, receiving only
- Wullenweber, receiving only (Code 132 55)
- High take off angle, transmitting/receiving (tower supported)
- Hermes loop array, receiving only
- Umbrella top-loaded monopole, transmitting (tower supported)
- Inverted-L, transmitting (tower supported)
- T-antennas, transmitting (tower supported)
- Various VLF antennas, transmitting/receiving

### **132 50 PUBLIC ADDRESS SYSTEM - OUTDOOR (EA)**

**FAC: 1321**

**BFR Required: N**

**Design Criteria:** UFC 4-021-01, Design and O&M: Mass Notification Systems

13250-1 Outdoor public address systems will be planned and installed to meet individual needs of a facility.

### **132 55 CIRCULARLY DISPOSED ANTENNA ARRAY (WULLENWEBER) (EA)**

**FAC: 1321**

**BFR Required: N**

13255-1 This antenna array is generally planned in conjunction with a Circularly Disposed Antenna Array Building. See Category Code 131 55 for additional guidance.

13255-2 The Department of Navy no longer maintains a HFDF mission. As a result, Circularly Disposed Antenna Arrays contained within inventory are in the process of being demolished or are have been converted for use in other category codes. Category Code 132 55 is provided for information purposes only and should not be used.

## 133 NAVIGATION AND TRAFFIC AIDS – BUILDINGS (NON-SHIP RELATED)

133-1 **DESCRIPTION.** Basic Category Code group 133 applies to those Air Traffic Control Facilities (ATCFs) that contain the equipment, devices, and personnel responsible for air traffic control and navigational aids. This group discusses complete air traffic control classes and systems, which are defined below. Other elements of air traffic control and navigation aids that are remotely located around the airfield can be found in the 133, 134 and 135 series of Category Codes.

133-1.1 **Air Traffic Control Facility (ATCF).** The ATCF includes personnel and equipment associated with the operation of the following:

- Control Tower
- Approach Control
- Terminal Radar
- En Route Radar
- Flight Planning
- Air Navigational Aids

The standard ATCF serves as the foundation for all other ATCF planning standards by establishing a common baseline for ACTF resource determinations. Addressed within the standard are the needs for ATCF classification, the concepts used for standard development, descriptions of the services provided by ATCFs and definitions of the resulting six ATCF classes.

133-1.2 **ATCF Classification Scheme.** The approach to standard development, by definition, is the process of arranging items into groups based on the systematic division of common traits. The underlying principle for establishing a classification scheme is that each resultant class must encompass common elements. Since Navy Air Traffic Control (ATC) is one of a large number of closely interrelated elements collectively supporting the naval aviation mission, the classification scheme must identify all elements that bear upon the performance of ATC and analyze each for commonality across the spectrum of ATCFs. The ATCF classification scheme, by segregating ATC services into groups, establishes six major classes as shown in Table 133-1.

**Table 133-1 ATCF Classification Scheme**

<b>Class</b>	<b>Description</b>
Class I	Flight Planning Facility
Class II	Control Tower Facility
Class III	Control Tower with Ground Control Approach (GCA) Facility (Class III ATCFs

Class	Description
	can be further identified by GCA pattern control authority, i.e., with or without)
Class IV	Approach Control Facility
Class V	Joint Control Facility
Class VI	Fleet Area Control and Surveillance Facility

133-1.3 **ATC Services.** ATC services include five distinct directives that are provided slightly or in combination at every ATCF:

133-1.3.1 **Flight Assistance Service.** The planning of a flight is the first element of an air operation. Safety of flight is dependent on thorough flight planning covering itinerary, times, and weather. Flight assistance services interface the flight crew with the air traffic control system and encompass work, space, personnel, equipment, and information related to:

- Planning a flight.
- Introducing the plan into the ATC system.

133-1.3.2 **Airport Traffic Control Service.** Airport traffic control encompasses those services provided to aircraft operating within the airport traffic area or on the airport surface. They include:

- Issuing control instructions to provide sequencing to assure the orderly and expeditious movement of aircraft departing, landing, or approaching the airport or landing.
- Furnishing information to pilots concerning clearances to operate aircraft, weather and field conditions, and pertinent operating and procedural instructions.
- Relaying aircraft operation and control messages between pilots and other air traffic facilities.
- Notifying crash and rescue agencies during actual or potential accidents on or in the vicinity of the airport. These services are somewhat unique as they are the only services that are location sensitive; using today's technology, they also require an elevated structure and visual contact.

133-1.3.3 **Low Approach and Landing Service.** This service permits aircraft to be recovered when weather ceilings and visibility are less than that prescribed for Instrument Approach Procedures (IAPs) predicated on the non-precision air navigational aids. The service encompasses:

- Issuing control instructions to provide separation to aircraft approaching for landing under marginal weather conditions.
- Providing control instructions and information to align aircraft in azimuth and altitude so an optimum touchdown point on the landing surface may be reached.

**133-1.3.4 Terminal Area Control Service.** Terminal area control services provide separation and control of aircraft operating in the relatively dense air traffic environment surrounding major airports. Services are exclusive to those performed as part of airport traffic control and low approach and landing services. This service includes:

- Separation and control of departing and arriving aircraft operating under Instrument Flight Rules (IFR).
- Separation and control of transiting aircraft operating under IFR.
- Separation and control of aircraft operating under Visual Flight Rules (VFR) that desire the added margin of safety afforded by such control.

**133-1.3.5 Range Control (Air) Service.** Range control (air) services combine both ATC in the classic sense, i.e., separating aircraft from each other or obstructions, and the provisions of combat direction and/or range surveillance. Services are mission-oriented and encompass:

- Mission aircraft flight-following.
- Mission aircraft direction.
- National Airspace System Interface.

#### 133-1.4 ATCF Class Definitions.

**133-1.4.1 Class I.** Flight Planning Activity (also known as an Air Operations Building, Category Code 141 40). An ATCF organized, manned, and equipped to provide flight assistance services to aircrews including flight planning and flight safeguarding services. The air operations building is generally located on the edge of the airfield adjacent to the air traffic control tower and Military Terminal Radar Approach Control Facility (MTRACON), Category Code 133-72.

**133-1.4.2 Class II.** Control Tower (Category Code 141 70). An ATCF organized, manned, and equipped to provide airport traffic control services including: air traffic sequencing to aircraft airborne within the airport traffic area; authority for aircraft to land or takeoff from runways, or heliports; and control of aircraft and vehicles on the surface within the movement area to ensure safe, orderly, and expeditious aircraft movement. Unless modified by letter of agreement, the air traffic control clearance authority vested in the tower is limited to that permitted operation in accordance with VFR; although IFR or special VFR air traffic control clearances, originated by other tower facilities having such authority, may be relayed by the tower. Flight assistance services may also be provided. The air traffic control tower facility is generally located on the edge of the airfield, situated to have an unobstructed line-of-sight to the aircraft approach areas, runways, taxiways, aircraft parking areas, and other operational areas over which aircraft movements are to be controlled. Provide tower location and height to result in lower cab eye level line of site intersecting airport traffic surfaces at a vertical angle of 35 minutes or greater.



133-1.4.3 **Class IIIA/IIIB.** Control Tower/Ground Control Approach (GCA) Facility (also referred to as a Radar Air Traffic Control Facility (RATCF), Category Code 133 71). An ATCF is organized, manned, and equipped to provide air traffic control and low approach and landing services, including: air traffic sequencing to aircraft airborne within the airport traffic area; authority for aircraft to land or takeoff from runways, or heliports; control of aircraft and vehicles on the surface within the movement area; and control instructions to aircraft during the intermediate and final approach segments (Class IIIA) to ensure safe, orderly, and expeditious aircraft movement. Unless modified by letter of agreement, the air traffic control clearance authority vested in the control tower is limited to that permitted for operation in accordance with VFR, although IFR and special VFR air traffic control clearances, originated by other facilities having such authority, may be relayed or issued. Likewise, GCA control authority may be extended beyond the intermediate fix when authorized by letter of agreement (Class IIIB). Flight assistance services may also be provided. This facility is generally located adjacent to the air traffic control tower.

133-1.4.4 **Class IV.** Approach Control Facility (also referred to as a Military Terminal Radar Approach Control Facility (MTRACON), Category Code 133-72). An ATCF organized, manned, and equipped to provide airport traffic control and terminal area services including: separation and control to arriving, departing, and occasionally en route aircraft operating in accordance with IFR and, when appropriate, VFR within airspace assigned for the purpose by letter of agreement, to ensure safe, orderly, and expeditious aircraft movement. Service to the primary airport include: air traffic sequencing to airborne aircraft within the traffic area; authority for aircraft to land or take off from runways or heliports; and control of aircraft and vehicles on the surface within the movement area. These facilities are authorized to originate IFR and special VFR air traffic control clearances for aircraft landing and departing airports within their assigned area of responsibility or transiting airspace under their control jurisdiction, including instrument approach and departure clearances. They may also provide low approach and landing and flight assistance services. This facility is generally located adjacent to the air traffic control tower and aircraft operations building where site requirements permit.

133-1.4.5 **Class V.** Joint Control Facility (JCF) (Category Code 133 74). A combined air ATCF and Range Operations Center (ROC), organized, manned, and equipped to provide Class II, IIIA/B, or IV services and range control services. ROC services may include: aircraft control, separation, positioning, tracking, and target scoring. ROC operational jurisdiction is typically limited to special use airspace (restricted areas, Military Operations Areas (MOAs), or ATC Assigned Airspace (ATCAA)). The JCF is located adjacent to the air operations building when site criteria allows. An air traffic control tower may be sited with the JCF.

133-1.4.6 **Class VI.** Fleet Area Control and Surveillance (FACSFAC) (Category Code 133 73). A FACSFAC is an ATCF facility defined as an organization of personnel and equipment designated, equipped, and manned to manage offshore and inland operating areas, as required, dedicated for military use. The mission of a FACSFAC is to manage military use of Offshore Operating Areas (OPAREAS) through coordination, scheduling, and control, if applicable, of subsurface, surface, and airborne military platforms operating within and transiting to and from these areas. FACSFACs are established as an intermediate level facility between that of a Military Radar Unit (MRU) and an ATCF. Prior to being upgraded from a MRU level facility to an intermediate level ATCF, FACSFACs must comply with the following requirements:

- Possess flight check data depicting areas of radio/radar coverage.
- Possess radar/radio communication redundancy in areas routinely used for national airspace interface.
- Validate operator training programs by assuring compliance with FAA, OPNAV, and FACSFAC personnel qualification standards.
- Implement comptroller certification standards in compliance with FAA publications and the OPNAVINST 3721.1K.
- Possess auxiliary power to support the Fleet Area Control System (FACS) in the event of loss of commercial power.
- Obtain FACS interface certification with the FAA.

Each FACSFAC is tailored to meet the operational needs of a specific area in direct support of the fleet operational requirements. For purposes of identification, equipment and personnel control, each FACSFAC, at time of commissioning, is placed under the operational control of the supported command; administrative control is through the local commander; and technical support is received from Naval Electronic Systems Command (NAVELEX). Each FACSFAC is a stand-alone facility. Table 133-2 defines each of the six different types of ATCFs with their respective facility nomenclature in tabular form.

**Table 133-2. ATCF Classes and Facility Nomenclature**

Class ATC Facility	Air Operations Building	Control Tower	RATCF	MTRACON	JCF	FACSFAC
1	X					
2	X	X				
3	X	X	X			
4	X	X		X		
5	X	X			X	
6						X

**133 15 RADAR WIND SOUNDING (RAWIN) BUILDING****FAC: 1331****BFR Required: Y**

13315-1 **DEFINITION.** A RAWIN building (Radar Wind Sounding) is a specialized weather reporting facility. It houses tracking equipment used in conjunction with balloon-borne radiosonde transmitters.

13315-2 **GENERAL.** An engineering analysis is required to determine facility space allocations.

**133 20 VERY HIGH FREQUENCY (VHF) OMNI-DIRECTIONAL RANGE (VOR) FACILITY (M2/SF)****FAC: 1331****BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13320-1 **DEFINITION.** The Very High Frequency (VHF) Omni-Directional Range (VOR) building houses a VHF, fixed ground-based station which continuously transmits bearing, identification, and with proper equipment, distance information to properly equipped aircraft.

13320-2 **REQUIREMENTS.** A gross area of 28 M2 (300 SF) is provided for the electronic equipment, monitoring and test equipment, and mechanical equipment. A vehicle access road is required.

13320-3 **SITE PLANNING.** Any facility located within the Airfield Safety Clearance Zone as defined by NAVFAC P-80.3 requires a criteria waiver approved by COMNAVAIRSYSCOM (Code 09Y1). Any equipment that must be located in violation of the Safety Clearance Zone criteria shall be coordinated with the In Service Engineering Agent (ISEA). The ISEA must ensure that such equipment will be sited as far as possible away from the operating surface toward the outer limits of the NAVFAC P-80.3 criteria.

**133 25 TACTICAL AIR NAVIGATION (TACAN) BUILDING (M2/SF)****FAC: 1331****BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13325-1 **DEFINITION.** The Tactical Air Navigation (TACAN) Building houses UHF ground-based station which transmits bearing, identification, and distance information to

properly equipped aircraft. The TACAN is primarily a military short-range 322 km (200 mile) navigational aid that is generally planned for each Navy and Marine Corps air station.

13325-2 **REQUIREMENTS.** A TACAN building is not required at those air stations which can be serviced by a TACAN or VORTAC of a nearby airfield, either military or civilian. A gross area of 28 M2 (300 SF) is provided for the electronic equipment, monitoring and test equipment, and mechanical equipment. A vehicle access road is required.

13325-3 **SITE PLANNING.** Any facility located within the Airfield Safety Clearance Zone as defined by NAVFAC P-80.3 requires a criteria waiver approved by COMNAVAIRSYSCOM (Code 09Y1). Any equipment that must be located in violation of the Safety Clearance Zone criteria shall be coordinated with the In Service Engineering Agent (ISEA). The ISEA must ensure that such equipment will be sited as far as possible away from the operating surface toward the outer limits of the NAVFAC P-80.3 criteria.

### **133 30 VERY HIGH FREQUENCY (VHF) OMNI-DIRECTIONAL RANGE/TACTICAL AIR NAVIGATION (VORTAC) BUILDING (M2/SF)**

**FAC: 1331**

**BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13330-1 **DEFINITION.** The Very High Frequency (VHF) Omni-Directional Range/Tactical Air Navigation (VORTAC) Building houses VHF/UHF fixed ground-based station that continuously transmits bearing, identification, and distance information to properly equipped aircraft when distance measuring equipment (DME) is installed.

13330-2 **REQUIREMENTS.** A gross area of 28 M2 (300 SF) is provided for the electronic equipment, monitoring and test equipment, and mechanical equipment. A vehicle access road is required.

13330-3 **SITE PLANNING.** Any facility located within the Airfield Safety Clearance Zone as defined by NAVFAC P-80.3 requires a criteria waiver approved by COMNAVAIRSYSCOM (Code 09Y1). Any equipment that must be located in violation of the Safety Clearance Zone criteria shall be coordinated with the In Service Engineering Agent (ISEA). The ISEA must ensure that such equipment will be sited as far as possible away from the operating surface toward the outer limits of the NAVFAC P-80.3 criteria.

**133 35 NON-DIRECTIONAL BEACON (NDB) FACILITY (M2/SF)****FAC: 1331****BFR Required: Y**

Design Criteria: None Available.

Planning Criteria: P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13335-1 **DEFINITION.** This Non-Directional Beacon (NDB) facility is an unattended facility which houses electric equipment (radio beacon) used to transmit a non-directional radio signal pattern to aircraft equipped with Automatic Radio Direction and Finding (ADF) equipment. The signal is used by the aircraft for homing and radio fix assistance. The radio beacon may be employed for voice or tone modulated transmission. The facility consists of an equipment building with adjoining or adjacent space with emergency standby power and an antenna mounted on an antenna support.

13335-2 **REQUIREMENTS.** The facility is required at all Navy and Marine Corps air stations unless other navigational aid facilities obviate the need. The NDB is located on or adjacent to the airport. Metal buildings, power lines, or metal fences should be kept a minimum of 30.5 meters (100 feet) from the NDB antenna. The building area is 11.2 M2 (120 gross SF) and requires an antenna support.

13335-3 **SITE PLANNING.** NDB may be located either on or off the station with specific siting satisfactory to NAVAIRSYSCOM and NAVELEXSYSCOM.

**133 65 AIR NAVIGATION BUILDING (M2/SF)****FAC: 1331****BFR Required: Y**

Design Criteria: None Available.

Planning Criteria: P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13365-1 **DEFINITION.** An Air Navigation Building is a specialized facility for providing a readily available source of operational and aeronautical intelligence information; storage and issue of aeronautical maps and charts; and secure storage of classified material up to TOP SECRET documents.

13365-2 **REQUIREMENTS.** There are two types of air navigation buildings:

13365-2.1 **Type A Building.** A Type A building requires a gross area of 417 M2 (4,487 SF) and is planned for flight support air stations having an area command mission.

13365-2.2 **Type B Building.** A Type B building requires a gross area of 1,010 M2 (10,863 SF) and is planned for those stations having logistics support for a major area command such as COMNAVAIRLANT or COMNAVAIRPAC.

13365-3      **SECURE STORAGE.** Secure storage areas are provided in conformance with OPNAVINST 5510.1 (latest revision).

**133 71    RADAR AIR TRAFFIC CONTROL FACILITY (RATCF) (M2/SF)**

**FAC: 1331**

**BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13371-1      **DEFINITION.** The Radar Air Traffic Control Facility (RATCF) provides housing for equipment and personnel to support Instrument Flight Rules (IFR) control of aircraft on approach to or departure from the terminal radar facility or airport. Other functions include Precision Approach Radar (PAR) for landing aircraft during inclement weather and limited visibility. It provides space for an IFR control room that contains radar display consoles and communications terminals, equipment rack storage for communications terminal equipment, a ready room for Air Traffic Control (ATC) watch standers, a training room, and office area for supervision and control.

13371-1.1      **Components.** The RATCF, a Class IIIA/IIIB activity, contains the Control Tower/Ground Controlled Approach (GCA) Facility. An Air Traffic Control Facility (ATCF) organized, manned, and equipped to provide air traffic control and low approach and landing services, including:

- Air traffic sequencing to aircraft airborne within the airport traffic area.
- Authority for aircraft to land or takeoff from runways or heliports.
- Control of aircraft and vehicles on the surface within the movement area.
- Control instructions to aircraft during the intermediate and final approach segments (Class IIIA) to ensure safe, orderly, and expeditious aircraft movement.

13371-1.2      **Control Authority.** Unless modified by letter of agreement, the air traffic control clearance authority vested in the control tower is limited to that permitted for operation in accordance with Visual Flight Rules (VFR), although IFR and special VFR air traffic control clearances, originated by other facilities having such authority, may be relayed or issued. Likewise, GCA control authority may be extended beyond the intermediate fix when authorized by letter of agreement (Class IIIB). Flight assistance services may also be provided. Consult Basic Category Code 133 information for additional ATCF class information.

13371-2      **REQUIREMENTS.** The facility space allowance is 402 M2 (4,320 SF) gross area which includes mechanical equipment room.

13371-3      **SITE PLANNING.** The facility should be sited adjacent to the air traffic control tower when site conditions permit.

**133 72 MILITARY TERMINAL RADAR APPROACH CONTROL FACILITY  
(MTRACON) (FORMERLY RATCC CENTER) (M2/SF)**

**FAC: 1331**

**BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13372-1 **DEFINITION.** A Military Terminal Radar Approach Control (MTRACON) Facility is used to control air traffic to provide safe, expeditious, and orderly movement of aircraft under all weather conditions. Justification for a MTRACON is established by the Chief of Naval Operations.

13372-1.1 **Components.** The MTRACON is a Class IV, Approach Control, Air Traffic Control Facility (ATCF). An ATCF is organized, manned, and equipped to provide airport traffic control and terminal area services including:

- Separation and control to arriving, departing, and occasionally en route aircraft operating in accordance with Instrument Flight Rules (IFR) and, when appropriate, Visual Flight Rules (VFR) within airspace assigned for the purpose by letter of agreement, to ensure safe, orderly, and expeditious aircraft movement.
- Air traffic sequencing to aircraft airborne within the airport traffic area.
- Authority for aircraft to land or takeoff from runways or heliports.
- Control of aircraft and vehicles on the surface within the movement area.
- Control instructions to aircraft during the intermediate and final approach segments (Class IIIA) to ensure safe, orderly, and expeditious aircraft movement.

These facilities are authorized to originate IFR and special VFR air traffic control clearances for aircraft landing or departing airports within their assigned area of responsibility or transiting airspace under their control jurisdiction, including instrument approach and departure clearances. They may also provide low approach and landing and flight assistance services. Consult Basic Category 133 information for additional ATCF class information.

13372-1.2 **Operation of a MTRACON.** NAVAIR 00-80T-114 promulgates policies affecting the establishment and operation of a MTRACON and its component radar systems. The area of jurisdiction for a MTRACON facility extends beyond the area of responsibility assigned to a Radar Air Traffic Control Facility (RATCF).

13372-2. The MTRACON radar facilities may consist of the Air Surveillance Radar (ASR) facility, Category Code 133 75, the Air Route Surveillance Radar (ARSR) facility, Category Code 133 76, and the Precision Approach Radar (PAR), Category Code 134 40, located on a turntable. Video information from each of these radars is transmitted to remote monitors in the MTRACON and control tower by underground cable or microwave relay.

13372-3 **SITE PLANNING.** Wherever practicable it is highly desirable that the MTRACON, the Control Tower, Attached/Free Standing, Category Code 141 70, and the Aircraft Operations Building, Category Code 141 40, be located together as an integral unit. If site conditions dictate the separation of the Air Operations Building and the Control Tower, the MTRACON should be collocated with the control tower, creating an integrated air traffic control facility.

13372-4 **REQUIREMENTS.** The MTRACON requires a gross area of 1,230 M<sup>2</sup> (13,200 SF). The nerve center of the MTRACON is the control room which contains the radar monitors and communications modules. A radar and communications terminal equipment room houses the audio and video tape recorders as well as the automation central (or terminal) equipment. An office for the FAA liaison officer, training classroom, a ready room for radar controllers on work breaks, a Combined radar/ training chief office, leading chief office, MTRACON equipment maintenance and office space, an air traffic control officer's office, and a proficiency trainer room are also provided. Space is also provided in the mechanical room for an emergency generator system and Uninterruptible Power Supply (UPS) system.

### **133 73 FLEET AREA CONTROL SURVEILLANCE FACILITY (M<sup>2</sup>/SF)**

**FAC: 1331**

**BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13373-1 **DEFINITION.** The Fleet Area Control Surveillance Facility (FACSFAC) building houses the FACSFAC Tracking System (FACTS) and Navy Tactical Data System/Advanced Combat Direction System (NTDS/ACDS) equipment and personnel to provide a variety of services to air, surface and subsurface units. These services are provided to both military and civilian users and include radar surveillance and various forms of air traffic control in warning and other special airspace areas. Other services include:

- Surface operating area management.
- Ground controlled intercept.
- Operating area scheduling.
- Range control.

The FACSFAC normally operates continuously, 24 hours per day, and 7 days per week.



13373-1.1 **Components.** The FACSFAC is a Class VI Air Traffic Control Facility (ATCF) and is defined as an organization of personnel and equipment designated, equipped, and manned to manage offshore and inland operating areas, as required. The mission of a FACSFAC is to manage military use of Offshore Operating Areas (OPAREAS) through coordination, scheduling, and control, if applicable, of subsurface, surface, and airborne military platforms operating within and transiting to and from these areas. FACSFACs are established as an intermediate level facility between that of a Military Radar Unit (MRU) and an ATCF. Prior to being upgraded from a MRU level facility to an intermediate level ATCF, FACSFACs must comply with the following requirements:

- Possess flight check data depicting areas of radio/radar coverage.
- Possess radar/radio communication redundancy in areas routinely used for national airspace interface.
- Validate operator training programs by assuring compliance with FAA, OPNAV, and FACSFAC personnel qualification standards.
- Implement comptroller certification standards in compliance with FAA publications, the OPNAVINST 3721.1K, and the NAVAIR 00-80T-114.
- Possess auxiliary power to support the Fleet Area Control System (FACS) in the event of loss of commercial power.
- Obtain FACS interface certification with the FAA.

Consult Basic Category Code series 133 for additional ATCF information.

13373-1.2 **Operational Organization.** Each FACSFAC is tailored to meet the operational needs of a specific area in direct support of the fleet operational requirements. For purposes of identification, equipment and personnel control, each FACSFAC, at time of commissioning, is placed under the operational control of the supported command; administrative control is through the local commander; technical support is received from Naval Electronic Systems Command (NAVELEX).

13373-1.3 **Functions.** The FACSFAC functions include:

- Radar Air Traffic Control and Area Management.
- Communications Monitoring and Control.
- Command Administration.
- Equipment Maintenance.
- Training and Briefings
- Computer Systems Management and Engineering.

13373-2 **SITE PLANNING.** Facility normally stands alone and can be sited either on or off Station.

13373-3 **REQUIREMENTS.** The standard size of the FACSFAC building is 2,570 M2 (27,650 SF) gross area. The mechanical space should include sufficient room for an emergency generator system and an Uninterruptible Power Supply (UPS) system. The

size of the facility should be adjusted in accordance with the specific mission and number of personnel assigned.

**133 74 JOINT CONTROL FACILITY (M2/SF)**

**FAC: 1331**

**BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities  
**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13374-1 **DEFINITION.** The Joint Control Facility (JCF) is an air traffic control facility, a Radar Air Traffic Control Facility (RATCF), and a Range Operations Center (ROC) under one roof.

13374-1.1 **Components.** The JCF is a Class V Air Traffic Control Facility (ATCF). It is a combined air ATCF and ROC, organized, manned, and equipped to provide Class II, IIIA/B, or IV services and range control services. ROC services may include aircraft control, separation, positioning, tracking, and target scoring. ROC operational jurisdiction is typically limited to special use airspace (restricted areas, Military Operations Areas (MOAs), or ATC Assigned Airspace (ATCAA). The JCF is located adjacent to the air operations building when siting criteria allows. An air traffic control tower may be sited with the JCF. Consult Basic Category Code group 133 for additional ATCF class information.

13374-2 **REQUIREMENTS.** The specific functional areas to be provided include a main operations room where air traffic control radar display monitors and communications terminals are located; adjacent equipment spaces for communications devices, recorders and navigational aids; maintenance spaces for Ground Electronics Maintenance Division (GEMD) support personnel; and administrative spaces for command functions, training and personnel administration. The mechanical spaces should include sufficient space for an emergency generator system and Uninterruptible Power Supply (UPS) system. See Table 13374-1 for space allowances for the JCF facility.

**Table 13374-1. Joint Control Facility Space Allowances**

Type of Facility	Gross Area	
	M2	SF
Medium Density	3,156	33,970
High Density	3,670	39,500

13374-3 **SITE PLANNING.** The JCF should be located adjacent to the Air Operations Building when site conditions permit. The Air Traffic Control Tower, Category Code 141 70, should be sited with the JCF.

**133 75 AIR SURVEILLANCE RADAR (ASR) FACILITY (M2/SF)****FAC: 1331****BFR Required: Y****Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13375-1 **DEFINITION.** The Air Surveillance Radar (ASR) facility is an unattended facility which serves as a major component of the Radar Air Traffic Control Facility (RATCF), Category Code 133 71; the Military Terminal Approach Control Facility (MTRACON), Category Code 133 72; and the Joint Control Facility (JCF), Category Code 133 74. It provides detection and identification for control of aircraft operating in a line-of-sight range and altitudes determined by system design. The system also provides azimuth and range data and is remotely controlled by the air traffic control personnel via underground cables or microwave link. It consists of a rotating radar antenna mounted on a supporting tower, a transportable building which houses the electronic equipment, and a standby power plant installed in a separate transportable shelter. The facility and its antenna are located under the direction of Naval Electronics Systems Command (NAVELEX) and defined in the Base Electronic Systems Engineering Plan (BESEP).

13375-2 **SITE PLANNING.** The ASR is the standard terminal air traffic control surveillance radar for the Navy, Air Force, and FAA. It is a separate facility, housing radar transmitting, receiving, and monitoring equipment and maintenance personnel to provide detection and identification of aircraft transiting the area or executing and instrument approach or departure. The building and its associated antenna tower are located in a remote area of the airfield and an access road and emergency generator are required. Information derived from the ASR is transmitted to the MTRACON, RATCF, or JCF by underground cable or microwave link, and the ASR is remotely controlled from the MTRACON, RATCF, or JCF.

13375-3 **REQUIREMENTS.** The ASR facility has a gross area of 130 M2 (1,400 SF) including mechanical equipment room.

**133 76 AIR ROUTE SURVEILLANCE RADAR (ARSR) FACILITY (M2/SF)****FAC: 1331****BFR Required: Y****Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13376-1 **DEFINITION.** The Air Route Surveillance Radar (ARSR) facility houses the electronic long range radar system used to obtain the range and azimuth of an aircraft. When equipped with an Air Traffic Control Radar Beacon System (ATCRBS), the Air Route Surveillance Radar System (ARSR) obtains altitude and identification of the aircraft. The ARSR has a range greater than that of an ASR, and as such, is used

primarily for Fleet Area Control and Surveillance Facility (FACSFAC), Category Code 133 73 or Joint Control Facility (JCF), Category Code 133 74 functions. This facility is similar to the Air Surveillance Radar (ASR) facility, Category Code 133 75; the difference being that an ARSR is used to monitor a larger piece of airspace than an ASR. An ASR only controls overflight, approach, and departure flight paths at a terminal facility.

13376-2 **SITE PLANNING.** The ARSR building should be located adjacent to the radar facility antenna tower.

13376-3 **REQUIREMENTS.** The facility provides space primarily for the radar equipment systems, a small work bench for maintenance of system equipment, storage areas for spare parts and restroom if required. The ARSR facility has an gross area of 174 M2 (1,876 SF), including mechanical equipment room.

### **133 80 WHEELS WATCH SHELTER (EA)**

**FAC: 1331**

**BFR Required: Y**

**Design Criteria:** Not Available

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13380-1 **DESCRIPTION.** A portable wheels watch booth is provided with the runway Wheels-Up/Wave-Off Lighting system, Category Code 136 45. The shelter is located approximately 302 meters (990 feet) short of the runway threshold near the wheels-up/wave-off lighting system. The facility may be either a trailer or truck. Due to its location and access road and pad may be required and the shelter is an obstruction to airfield safety criteria, therefore a waiver is required from Naval Air Systems Command (NAVAIRSYSCOM) prior to its installation. Normally this requirement will be satisfied by portable equipment, Class III Property. However, this code may be used for planning purposes.

## **134 NAVIGATION AND TRAFFIC AIDS - OTHER (NON - SHIP RELATED)**

134-1 **DEFINITION.** Basic Category Code group 134 applies to structures which function as aircraft navigation/ traffic aids.

### **134 10 ANTENNA - NAVIGATION (EA)**

**FAC: 1341**

**BFR Required: N**

**Design Criteria:** Not Available

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13410-1 **DESCRIPTION.** An antenna system for navigation aid will vary with the type and purpose of the navigational aid. This Category Code shall be used to indicate entire antenna systems.

13410-2 **REQUIREMENT.** No specific planning factors are applicable.

## **134 20 AIRPORT AND/OR HELIPORT BEACON (EA)**

**FAC: 1341**

**BFR Required: N**

**Design Criteria:** FAA AC 150/5345-12C; NAVAIR 51-50AAA-12

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13420-1 **DEFINITION.** An airport and/or heliport beacon is an internationally recognized rotating or flashing illuminated beacon operated as a visual aid to air navigation to assist aircrews in locating and identifying airports and/or heliports. Basic criteria on usage of airport and/or heliport beacons may be found in Federal Aviation Administration Advisory Circular 150/5345-12 (L-801H), (L-802A), and (L-803A) Specifications for Airport and Heliport Beacons.

13420-2 **REQUIREMENTS.** Three functional types of airport and/or heliport beacons are: airport rotating, identification or code, and heliport beacons. Requirements for each type are as follows:

13420-2.1 **Airport Rotating Beacon.** This is required for each airfield; with exception that two adjacent airfields may have a common beacon. A lighted military airport is identified by a beacon showing alternate flashes of two white and one green light. An unlighted military airport is identified by white flashes only.

13420-2.2 **Identification or Code Beacon.** This is required when the airport beacon is more than 1,520 meters (5,000 feet) from the nearest point of the usable landing area or where two or more adjacent airfields use one common airport beacon. The identification or code beacon is non-rotating and flashes a signal, the code and color of which identify the field. Where a heliport is not part of an airfield and an operational requirement has been established, an identification beacon is required.

13420-2.3 **Heliport Beacon.** This is a rotating beacon that provides identification for a lighted heliport when it is not clearly associated with an airfield. The beacon should alternately flash white, green, and yellow. It is not to be installed within one mile of an existing airfield beacon or runway.

13420-2.4 **Hazard Beacon.** A hazard or obstruction beacon is a non-rotating beacon with a flashing red light used where special warning is required to identify a

hazard to air navigation and is incorporated in Category Code 134 50, Obstruction Lighting, Aircraft.

### **134 40 GROUND CONTROL APPROACH SYSTEM (EA)**

**FAC: 1341**

**BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13440-1 **DEFINITION.** A Ground Control Approach (GCA) System is a radar approach system operated from the ground by air traffic control personnel transmitting instructions to the pilot by radio. The approach may be conducted with surveillance radar (ASR), Category Code 133 75, only or with both surveillance and precision approach radar (PAR), Category Code 134 41.

13440-1.1 **Components.** A GCA system is part of a Class IIIA Air Traffic Control Facility (ATCF), see Basic Category 133. An ATCF is organized, manned, and equipped to provide air traffic control and low approach and landing services, including: air traffic sequencing to aircraft airborne within the airport traffic area; authority for aircraft to land or takeoff from runways, or heliports; control of aircraft and vehicles on the surface within the movement area; and control instructions to aircraft during the intermediate and final approach segments to ensure safe, orderly, and expeditious aircraft movement. Unless modified by letter of agreement, the air traffic control clearance authority vested in the control tower is limited to that permitted for operation in accordance with Visual Flight Rules (VFR), although Instrument Flight Rules (IFR) and special VFR air traffic control clearances, originated by other facilities having such authority, may be relayed or issued. Likewise, GCA control authority may be extended beyond the intermediate fix when authorized by letter of agreement (Class IIIB). Flight assistance services may also be provided. The GCA system is generic in terms of name; therefore, the two components should be identified separately by their respective Category Codes.

### **134 41 PRECISION APPROACH RADAR (PAR) (EA)**

**FAC: 1341**

**BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13441-1 **DEFINITION.** The Precision Approach Radar (PAR) is an unattended self-contained radar system. The PAR detects azimuth, elevation, and range information of aircraft on final landing approach to PAR instrumented runways. The information is displayed in the Military Terminal Radar Approach Control (MTRACON) Facility. The controller uses the information to direct the aircraft along the glide path to the visual

portion of an instrument approach. A PAR is a self-contained transportable unit mounted either on a turntable or on fixed base.

13441-2 **REQUIREMENTS.** A reinforced concrete platform is provided for fixed mounted PAR. Reinforced concrete foundations are provided to support the turntable mounted PAR frame.

### **134 42 PRECISION APPROACH LANDING SYSTEM (PALS) (EA)**

**FAC: 1341**

**BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13442-1 **DEFINITION.** The Precision Approach Landing System (PALS) is an unattended, self-contained radar system. The PALS detects azimuth, elevation, and range information of aircraft on final approach to PALS instrumented runways. This information is displayed in the Military Terminal Radar Approach Control (MTRACON) Facility. The controller uses the information to direct the aircraft along the glide path to the visual portion of an instrument approach.

13442-2 **REQUIREMENTS.** Reinforced concrete foundations are required for the PALS antenna tower.

### **134 43 INSTRUMENT LANDING SYSTEM (ILS) (EA)**

**FAC: 1341**

**BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13443-1 **DEFINITION.** The Instrument Landing System (ILS) provides azimuth, distance, elevation, and glide path position to aircraft on a precision approach to the ILS instrumented runway. The ILS operates in the VHF and UHF radio bands.

13443-2 **REQUIREMENTS.** The ILS consists of two stations, a localizer and antenna station, and a glide slope equipment station. The localizer station requires a 5.49 meter by 6.1 meter (18 foot by 20 foot) concrete pad for the building housing the localizer equipment and a 3.66 meter by 5.49 meter (12 foot by 18 foot) concrete pad for the glide slope equipment building.

13443-3 **SITE PLANNING.** Both stations are located near the ends of the runway and require access roads and a pull-off area for maintenance personnel.

**134 44 MICROWAVE LANDING SYSTEM (MLS) (EA)****FAC: 1341****BFR Required: Y****Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13444-1 **DEFINITION.** The Microwave Landing System (MLS) provides azimuth, distance, elevation, and glide path position to aircraft on a precision approach to the MLS instrumented runway. The MLS operates in a narrow band microwave frequency.

13444-2 **REQUIREMENTS.** The MLS consists of two stations, an azimuth station and an elevation station. Each station requires a concrete foundation pad for the respective types of equipment. The azimuth station requires a 1.52 meter by 6.1 meter (5 foot by 20 foot) pad and the elevation station requires a 1.21 meter by 1.83 meter (4 foot by 6 foot) pad for the instrumentation device.

13444-3 **SITE PLANNING.** Both stations are located near the ends of the runway and require access roads and a pull-off area for maintenance personnel.

**134 45 SHORE BASED AUTOMATIC CARRIER LANDING SYSTEM (ACLS) (EA)****FAC: 1341****BFR Required: Y****Design Criteria:** None Available**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13445-1 **DEFINITION.** The Shore-based Automatic Carrier Landing System (ACLS) is an unattended, self-contained radar system. The ACLS consists of precision tracking radar coupled to a computer data link to provide continuous information to the aircraft, monitoring capability to the pilot, and a backup approach system. Four modes of approach are available, depending on aircraft equipment. In Mode 1 approaches, data-link-transmitted ACLS signals are coupled to the autopilot after ACLS radar lock-on and control the aircraft until touchdown. Mode 1A approaches differ from Mode 1 approaches in that data-link ACLS signals are uncoupled at ½ mile (approximately 61 meters (200 feet) altitude) from touchdown. Mode 2 approaches the pilot-controlled using data-link needles information displayed in the aircraft allowing the pilot to fly the aircraft to the minimums in effect. A Mode 3 approach is a controller talk-down approach using no special equipment on the aircraft.

13445-2 **REQUIREMENTS.** Reinforced concrete foundations are required for the Shore-based ACLS antenna tower.



**134 50 OBSTRUCTION LIGHTING AND MARKINGS (EA)****FAC: 1341****BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13450-1 **DEFINITION OF OBSTRUCTION.** An airfield obstruction is an object that extends above the air safety clearance surfaces established for the airfield. Any object that violates the clearance zone will be removed, if practical; reduced in height to below the hazard level; or marked as an obstruction. Standards for determining obstructions to air navigation have been established by U.S. Code and are published in Federal Aviation Regulations, Part 77, which covers "Objects Affecting Navigable Airspace."

13450-2 **OBSTRUCTION LIGHTING.** Obstruction lighting provides visual identification of objects at night, or in some cases in day times, that are potentially hazardous to air navigation.

13450-2.1 **Definition.** Obstruction lighting is a system of lights that define the vertical and horizontal limits of a hazard to aircraft operations. Hazardous conditions exist when any obstruction encroaches on the standard airfield clearance surfaces or an unsafe condition, such as construction, on the airfield exists. Obstruction lighting includes flashing beacons and steady burning lights, both of which are aviation red in color.

13450-2.2 **Requirements.** The configuration, type, and number of lights depend upon the height and type of obstruction to be identified and on its surroundings. For objects less than 45.7 meters (150 feet) in height only steady burning lights mounted at the top are used. For objects more than 45.7 meters (150 feet) in height a combination of one or more beacons and one or more levels of steady burning lights are used. For each required lighting level not less than one beacon or two lights will be visible at any azimuth angle and at all approach angles. Some obstructions may require several lights or beacons at each light level. Consult NAVAIR 51-50AAA-2 for additional lighting types that may be used.

In some instances, obstructions require higher intensity lighting to provide identification and adequate clearance of the object in restricted visibility, especially during daylight hours. These objects are typically tall antenna towers, transmission lines, and tall stacks or chimneys. It is recommended to use flashing higher intensity obstruction lighting systems that may be more effective and more economical to install and maintain where permitted. These lighting systems include: high intensity white obstruction lights; medium intensity obstruction lights; and dual red and higher intensity white lights. Consult NAVAIR 51-50AAA-2 for the necessary lighting type. It is necessary to provide lighting on all obstructions so that visibility of the lighting is assured from any normal angle of approach and from any direction.

13450-3 **OBSTRUCTION MARKINGS.** Obstruction markings provide visual identification of objects that are potentially hazardous to safe air navigation and to warn aircrews of their presence during daytime flight operations. The markings for different types of obstructions vary depending on the nature of the object and its location. The types of markings or markers used for obstructions include: painted markings; markers; and vehicle markings.

13450-3.1 **Painted Markings.** Painted markings are the most common form of obstruction marking. Most obstructions are marked by painting the surface. Obstruction marking colors are aviation orange and aviation white. Other colors sometimes used include yellow, black, red, and aluminum. Painted surfaces will change color with time by fading, cracking, and/or peeling. Repainting is a must. The size and shape of the obstruction determines the type of painting pattern used. Painting patterns include: solid patterns, alternate color bands, checkerboard patterns, and teardrop patterns. Consult NAVAIR 51-50AAA-2 for additional pattern information.

13450-3.2 **Markers.** Markers are used where it is impractical to mark an obstruction by painting. Markers may also be used in addition to painted markings if such markers may improve the conspicuity of the obstruction. These markers are displayed in conspicuous positions on or adjacent to the obstructions so as to retain the general definition of the obstruction. Markers should not increase the hazard that they mark. The two types of markers used include spherical markers and flag markers. Consult NAVAIR 51-50AAA-2 for marker usage.

13450-3.3 **Vehicle Markings.** Vehicle markings exist on vehicles used in the aircraft operational areas of the airfield and are marked according to NAVAIR 51-50AAA-2.

## 134 55 VISUAL APPROACH SLOPE INDICATOR (VASI) SYSTEM (EA)

**FAC: 1341**

**BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13455-1 **DEFINITION.** The Visual Approach Slope Indicator (VASI) System is an unattended system that provides visual glide slope guidance to pilots of aircraft during the final landing approach. The VASI is helpful during day and night operations and for Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) operations. These requirements apply only for existing VASI installations. For complete replacement use Precision Approach Path Indicator (PAPI) System, Category Code 134 56.

13455-2 **CONFIGURATIONS.** The VASI system consists of several light units arranged in two and three bars near the edges of the runway in the touchdown zone. Each light unit projects a beam, fan-shaped in azimuth and split vertically with a white

sector above and a red sector below. The light units are arranged in rows or bars on one or both sides of the runway. Each bar consists of two or three light units. If the bars are on both sides of the runway, the opposite bars shall be in the same line. The bar nearest the runway threshold is referred to as the downwind bar. The bar farthest from the threshold is the upwind bar. If the system has three bars, the bar between the others is the middle bar. A pilot making an approach and observing a two-bar VASI system will see one of the following configurations:

- On the established approach path angle, the downwind bar will be white and the upward bar will be red.
- Below the established approach path angle, both bars will be red.
- Above the established approach path angle, both bars will be white. In the transition sector where the light changes color, a narrow sector of the beam may appear to be pink. For a three-bar VASI system, which creates two approach path angles, the pilot uses the approach path angle established for his type of aircraft, and the third bar, although visible, is not part of the guidance system.

13455-3 **TYPES OF VASI SYSTEMS.** There are three types of VASI systems:

13455-3.1 **VASI-4 System.** This is a two-bar, four light unit system. There are two light units in each bar and are located only on one side, usually the left, of the runway. Some Navy airfields may have this system.

13455-3.2 **VASI-12 System.** This is a two-bar, twelve light unit system. There are three light units in each bar located on both sides of the runway. This is the system for joint use airfields with international civilian airline operations and some existing VASI installations at Navy airfields use this system.

13455-3.3 **VASI-16 System.** This is a three-bar, sixteen light unit system. There are three light units in each bar located on both sides of the runway for the downwind and middle bars and two lights on each side of the runway for the upwind bar. This system is used for airfields qualified for international civilian operations using large aircraft.

13455-4 **CRITERIA.** Conditions that may justify the requirement for a VASI installation are:

- The runway is used by aircraft with such characteristics that the approach angle must be maintained within close limits including speed and rate of descent.
- The runway is situation in an area where the pilots of some aircraft may have difficulty in judging the proper approach angle for any of the following reasons: 1) The approach is over water or featureless terrain that does not provide adequate visual cues; 2) Absence of

sufficient extraneous lights in the approach area at night; or 3) Visual information is misleading; e.g., deceptive terrain or sloping runways may cause false impressions.

- Objects in the approach area that may be a serious hazard if an aircraft descends below the normal approach path.
- Conditions at the runway ends may present special hazards to aircraft undershooting or overrunning the runway.
- Terrain or meteorological conditions create severe or unusual turbulence along the approach path.

All light units are elevated lights and shall be installed on stable concrete pads or bases. Each leg support of the unit shall be mounted on a frangible coupling.

**13455-5 LOCATION OF VASI BARS.** The preferred locations are 184 meters (600 feet) from threshold to the downwind bar and at 213 meter (700 foot) intervals for the other one or two bars. The Runway Reference Point (RRP) is normally located midway between the downwind and upwind bars of two-bar VASIs or downwind and middle bar of three-bar VASIs installations. VASI bars may be placed at other than preferred locations, but the downwind bar shall not be less than 152 meters (500 feet) or more the 244 meters (800 feet) from runway threshold. The other bar or bars shall not be less than 152 meters (500 feet) or more than 274 meters (900 feet) from the adjacent bar.

**13455-6 LOCATION OF THE LIGHT UNITS.** The centerline of the innermost light unit of each bar shall be not less than 15.2 meters (50 feet) and not more than 18.3 meters (60 feet) from the runway edge and not less than 22.9 meters (75 feet) from the edge of any other runway, taxiway, or apron area. The innermost light units of all bars of the system shall be the same distance from the runway edge. The light units for each bar shall be equally spaced at 4.88 meters (16 feet) on center starting from the innermost light units. The elevation of the horizontal apertures of the light units shall be within 0.31 meters (12 inches) of the crown of the runway, except in areas with deep snow accumulations. There the light unit may be installed with the apertures not to exceed 1.22 meters (48 inches) above the ground surface. For installations with light units on both sides of the runway, the elevations of the lights on opposite sides shall not differ by more than 0.31 meters (12 inches). The apertures of the light units in a bar may have a tolerance of 0.03 meters (1 inch) horizontally and vertically from the line of the bar.

## **134 56 PRECISION APPROACH PATH INDICATOR (PAPI) SYSTEM (EA)**

**FAC: 1341**

**BFR Required: Y**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13456-1     **DEFINITION.** The Precision Approach Path Indicator (PAPI) System is an unattended system which provides visual glide slope guidance to pilots of aircraft during the final landing approach. The PAPI system provides this information during the day and night for Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) operations as low as Category I conditions.

13456-2     **REQUIREMENTS.** The PAPI system consists of four light source units arranged in a wing bar near the edges of the runway in the touchdown area. Each light unit consists of two or more lamps and projects a beam of light, fan-shaped in azimuth and split vertically with a white sector above and a red sector below the transition zone. Each light unit is aimed at a slightly different elevation angle to present a different color pattern to a pilot on final approach depending on his/her position relative to the established approach slope. When observed from the ideal approach slope the two inboard light units are seen as red and the two outboard units as white. If more light units are red, the pilot is too low, and if more are white, he/she is too high. The lights also provide information on how much too high or too low the pilot is. The four light units are operated simultaneously whenever this runway approach is active.

13456-3     **CRITERIA.** Conditions that may justify the requirement for a VASI installation are:

- The runway is used by aircraft with such characteristics that the approach angle must be maintained within close limits including speed and rate of descent.
- The runway is situation in an area where the pilots of some aircraft may have difficulty in judging the proper approach angle for any of the following reasons: 1) The approach is over water or featureless terrain that does not provide adequate visual cues; 2) Absence of sufficient extraneous lights in the approach area at night; or 3) Visual information is misleading; e.g., deceptive terrain or sloping runways may cause false impressions.
- Objects in the approach area that may be a serious hazard if an aircraft descends below the normal approach path.
- Conditions at the runway ends may present special hazards to aircraft undershooting or overrunning the runway.
- Terrain or meteorological conditions create severe or unusual turbulence along the approach path.
- The runway length is short and there is serious danger of overrun if the touchdown is long.

All light units shall be installed on stable concrete bases and mounted on a frangible coupling.

13456-4 **LOCATION OF PAPI SYSTEM.** The wing bar shall be in a horizontal line at 90 +/-1 degrees to the runway centerline and should be on the left hand side of the runway as observed from the approach zone. To avoid intersecting runways or taxiways or other major installation problems, the PAPI may be located on the right side of the runway. The individual light units shall not be more than 0.08 meters (3 inches) longitudinally or in elevation from the line for the wing bar. The elevation of the line of the wing bar at the exit lenses or windows should be not more with 15.2 meters (50 feet) preferred. The other units shall be equally spaced at 9.2 +/- 0.6 meters (30 +/-2 feet). The preferred distance of the wing bar upwind from the runway threshold should be 305 +/- 30.5 meters (1,000 +/-100 feet). The actual location of this wing bar may be affected by the following conditions:

- The preferred distance of the wing bar shall be such as to have the visual approach slope coincide with the established glide path angle of the Precision Approach Radar (PAR), the Instrument Landing System (ILS), or other precision electronic approach aid.
- No light source unit shall be less than 22.9 meters (75 feet) from the edge of any other runway or any taxiway.
- The preferred distance of the wing bar shall ensure the minimum wheel clearance at threshold, usually 9.2 meters (30 feet), of the most critical aircraft normally using the runway or of obstacle clearance when the pilot is at or above the transition sector from red to white for the light source unit with lowest vertical aiming angle.
- The preferred distance of the wing bar shall be adjusted to compensate for the differences in elevation between the light exit windows and the runway threshold for sloping runways or for extra high installations to clear snow accumulations.
- The preferred distance of the wing bar shall provide adequate landing distance for stopping the most critical aircraft using this approach.

## 134 60 OPTICAL LANDING AIDS (EA)

**FAC: 1341**

**BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13460-1 **DEFINITION.** Optical Landing Aids (OLA) provides the pilot approaching for a landing with a visual signal to assist in intercepting and maintaining the correct approach glide slope. The OLA is a required visual aid for landings on aircraft carriers, but on shore-based airfields the OLA is primarily an aid for training or practice. The OLA may be used during day or night operations and in all weather conditions.

13460-2     **REQUIREMENTS.** The OLA systems are located near the touchdown point on the runway and consist of the following lighting components:

13460-2.1     **Source Lights.** The source lights are a yellow line of lights or images often referred to as the “meatball”. Some systems present a red signal when the aircraft is too low. The source lights may be formed by reflections in a special mirror or a vertical stack of lens cells or closely spaced lights.

13460-2.2     **Datum Lights.** The datum lights are a horizontal bar of green lights that provide a visual reference for determining the aircraft’s position in relation to the ideal approach glide path. The datum lights bar is in two groups of lights with a group on each side of the source lights. The visual signals presented to a pilot making an approach for landing are the same as his/her position relative to the glide slope path. If the source light appears to be above the datum lights he/she is too high, or if the source light appears to be below the datum lights he/she is too low and should adjust his/her approach path angle to obtain the correct on glide path signal with the source light in line with the datum lights.

13460-2.3     **Wave-off Lights.** The wave-off lights are flashing red lights along each side of the source lights. The wave-off lights are activated only to inform the pilot that he must execute a missed approach procedure.

13460-2.4     **Cut Lights.** Some optical landing systems have flashing green lights located above the source lights which are activated to instruct the pilot of propeller-driven aircraft to cut engine power.

13460-2.5     **Mounting Pad.** The height of the mounting pad shall be at ground level to preclude the creation of an obstruction when the OLA system is relocated from the site. During the calibration process the optimum height of the OLA system can be achieved by placing blocks under the equipment trailer cart and/or the addition of load leveling jacks to the cart.

13460-3     **TYPES OF OLA SYSTEMS.** There are four types of OLA Systems. The FLOLS, MOLS and IFLOLS are fixed signal systems that automatically indicate to the pilot his/her position in relation to the established glide path. The MOVLAS is a temporary replacement system for which the LSO controls the position of the source (“meatball”) light. The specifications for each of these systems are listed below.

13460-3.1     **Fresnel Lens Optical Landing System (FLOLS).** The FLOLS consists of five yellow source light cell assemblies arranged vertically, 12 green datum lights, 10 red wave-off lights, and some models have 4 green cut lights. The stack of lens cells are all lighted but usually only one cell is visible to the pilot. The relation of this cell to the datum lights indicates the pilot’s position relative to the proper glide slope. These lights are trailer-mounted for portability to move from one site to another.

13460-3.2     **Mirror Optical Landing System (MOLS).** The MOLS consists of a special mirror, 8 yellow source lights, 12 green datum lights, 10 red wave-off lights,

and may have two green cut lights and double obstruction lights. The mirror reflects the image of the source lights to provide the “meatball”. The position of the “meatball” in relation to the line of datum lights indicates the pilot’s position relative to the proper glide slope.

13460-3.3 **Manually Operated Visual Landing Aid System (MOVLAS).** The MOVLAS is an emergency system to be used when the FLOLS or MOLS is inoperable. The MOVLAS source light is operated by the Landing Signal Officer (LSO) using a special controller. The source lights are 23 lights arranged in two closely spaced vertical rows. The six lowest lights are red and the other 17 are yellow. Three lights at adjacent heights are operated to form the source lights. As the controller handle is moved upward, the source lights are switched on progressively towards the top in clusters of three. This gives an approaching pilot the signal to increase his elevation as directed by the LSO. The LSO therefore guides the pilot by signaling to raise or lower his/her altitude to achieve the proper glide slope. The MOVLAS is provided with 10 green datum lights, 8 red wave-off lights, and 2 green cut lights.

13460-3.4 **Improved Fresnel Lens Optical Landing System (IFLOLS).** The land-based MK 14 MOD 0 IFLOLS is the replacement system for the FLOLS MK 8 MOD 0 and MK 8 MOD 1 land-based systems. The IFLOLS consists of 12 cells which provide greater sensitivity and resolution to the light in the cell seen by the pilot (“meatball”) than the FLOLS. The position of the “meatball” relative to the datum lights indicates to the pilot where he/she is relative to proper glide slope. The IFLOLS system also has greater acquisition distance than the FLOLS. The land-based IFLOLS is also trailer-mounted for easy portability.

13460-4 **CRITERIA FOR JUSTIFYING OLA EQUIPMENT.** Each runway landing area with or programmed for a simulated carrier deck lighting installation shall be provided with a site installation and OLA equipment. Most OLA systems are portable and may be moved to different sites as the approach runway is changed. The use of OLA is intended for runway ends with simulated carrier deck lighting. Airfields without simulated carrier deck lights may have a need for proficiency that justifies the installation of OLA sites and equipment.

13460-5 **LOCATION OF OLA EQUIPMENT.** The OLA site shall be located on the left hand side of the runway as viewed by the approaching pilots. If the OLA is associated with a simulated carrier deck installation, the face of the lens cells or mirror shall be located 131.1 meters (430 feet) forward of the ramp athwartship lights. If the OLA is an independent installation for a three degree glide slope, the preferred location of the face of the lens cells or mirror is 228.7 +/- 3.05 meters (750 +/-10 feet) forward of the runway threshold but may be influenced by the following factors:

- The glide path angle for the primary electronic approach system.
- Special threshold crossing height requirements.
- Special ground point intercept for the runway or instrument approach system.



- Approach zone obstruction clearance requirements.
- Intersecting runways or taxiways.

The mounting pad shall be located so that the centerline of the lens cells is not less than 35.1 meters (115 feet) from the runway centerline and not less than 3.05 meters (10 feet) from the runway edge. To preclude the mounting pad from becoming an airfield obstruction when the OLA is relocated, the height of the pad should be no higher than 0.05 – 0.08 meters (2-3 inches) above terrain level (almost at ground level). The required height of the OLA should then be achieved by the use of concrete blocks on the pad and/or jacking screws attached to the OLA. The mounting pad shall be 3.4 meters x 5.2 meters (11 feet x 17 feet), level, and have a permanent survey marker for correct location and alignment of the centerline of the FLOLS cells. At 45.7 meters (150 feet) toward the runway threshold from the position for the face of the cells on a line parallel to the runway centerline, a survey monument for the siting mirror station for the FLOLS shall be installed. This monument or pad shall have a permanent survey marker for correct location of this equipment and should be at the same elevation as the mounting pad.

**NOTE:** Any new OLA pads installed at simulated carrier deck lighting installations or proficiency installations shall be made to accommodate an IFLOLS configuration. Pad size 3.4 meters x 5.2 meters (11 feet x 17 feet), perpendicular to the simulated carrier deck centerline, with an elevation at terrain level.

### **134 62 WIND DIRECTION INDICATOR (EA)**

**FAC: 1341**

**BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13462-1 **DEFINITION.** A Wind Direction Indicator provides visual information of the surface wind direction and general indication of the wind speed to the aircrew. This wind information is most useful during takeoff, for orientation to make an approach, and in the final phase of approach prior to touchdown.

Wind cones/socks are the most common type of wind direction indicators; however, wind tees do still exist and remain in this Category Code for inventory purposes. The "wind tee" is a "T" shaped rotating structure used at Navy and Marine Corps air installations as a navigational aid. It is positioned on the ground where it will be visible from all directions of approach and centrally located for identification and orientation from the air. The "wind tee" is outlined with green lights which, when lit, give it the appearance of a single green "T" when viewed from above. When the lights are not lit, it appears as a single stroke yellow "T". A background of crushed stone, gravel, or similar material that will retard the growth of vegetation and provide sharp contrast to the "wind tee" colors is provided.

13462-2      **REQUIREMENTS.** The standard wind direction indicator used on Navy and Marine Corps airfields is the 3.66 meter (12 foot) wind cone and is often called a wind sock. This wind cone is a fabric, truncated cone 3.66 meters (12 feet) long. The throat, or entrance for air into the cone is 0.91 meters (3 feet) in diameter to fit over the framework 1.37 meters (54 inches) long to hold the cone open. The color of the cone is orange or white and provides good contrast with its background when viewed from an altitude of 305 meters (1,000 feet). The support for the wind vane and illumination and obstruction lights, if used, is pivoted for lowering the cone and lights for maintenance. If the airfield or runways have lighted facilities for flight operations at night, the cone must be illuminated.

A 2.44 meter (8 foot) wind cone can be used for smaller, secondary airfields, heliports, or if necessary to locate the wind indicator closer than the standard runway. These wind cones are proportionately smaller than the larger size, be in contrast to their surroundings, have the same maintenance issues, and must be illuminated at night for visibility.

13462-3      **SITE PLANNING.** The location of the 3.66 meter (12 foot) wind cone is near the runway threshold not less than 122 meters (400 feet) from the centerline, preferably between 152 meters (500 feet) and 457 meters (1,500 feet) down the runway from the threshold. One wind cone may serve the ends of two runways if the distance from either runway centerline is not more than 305 meters (1,000 feet).

The location of the 2.44 meter (8 foot) wind cone is not less than 45.7 meters (150 feet) from the runway edge where clearance space or wind disturbances are not suitable for the 3.66 meter (12 foot) wind cone. If the wind cone is less than 91.4 meters (300 feet) from the runway edge, the support shall be low-mass or light-weight type.

## **134 64    RUNWAY DISTANCE MARKERS (EA)**

**FAC: 1341**

**BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Landbased Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13464-1      **DEFINITION.** The purpose of Runway Distance Markers (RDMs) is to indicate to aircrews the distance remaining to the end of the runway during takeoff and landing. The RDM provide this information for day and night operations in all weather conditions. The RDM should be provided for all runways where fixed wing jet aircraft operations are conducted and are recommended for runways intended for operations of propeller type aircraft. If the runway is used for nighttime or low visibility Instrument Flight Rule (IFR) operations, the RDM must be internally illuminated. If the runway is only used for daytime operations, the RDM may have unlighted markers.

13464-2 **REQUIREMENTS.** The RDM consists of a row of vertical markers (signs) spaced along each side of the runway longitudinally. The faces of the markers are vertical. Each face of the marker indicates the distance in thousands of feet remaining to each end of the runway. The color scheme used is white numerals on a black background.

13464-3 **SITE PLANNING.** The rows of RDM are parallel to and equidistant from the runway centerline. A pair of markers on opposite sides of the runway is located at each 305 meter (1,000 foot) spacing. The lines connecting the pairs of markers are perpendicular to the runway centerline. The apex or edges of the markers nearest the runway in each row shall form a line not less than 15.2 meters (50 feet) and not more than 22.9 meters (75 feet) from the full strength runway edge. The 22.9 meter (75 foot) distance is preferred. The marker cannot be less than 15.2 meters (50 feet) from the edge of any intersecting runway or taxiway. Where the 305 meter (1,000 foot) positions do not provide clearance from an intersecting runway or taxiway, the position of the pair of markers may be moved a maximum of 30.5 meters (100 feet) to obtain the clearance.

For runways that are not exact multiples of 305 meters (1,000 feet), the extra distance is apportioned at the runway ends by the following equation:

$$E = (D - M)/2$$

E = the excess distance in feet to be added to the intervals at the runway ends.

D = the length of the runway in feet.

M = the distance in feet of the maximum number of 305 meter (1,000 foot) intervals.

Consult NAVAIR 51-50AAA-2 for additional information of marker siting and special site conditions. The markers are internally illuminated. Runway distance markers are planned for all Navy and Marine Corps installation.

### 134 66 VOR/TACAN CHECK SIGN (EA)

**FAC: 1341**

**BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13466-1 **DEFINITION.** A VOR/TACAN Check Sign provides information for the pilot when verifying the operation of the navigational aid in the aircraft before taking off. This check sign is a visual identification marker erected in the area adjacent to the aircraft holding point at the taxiway access to runway ends. The sign includes the type of navigational aid, identification code, radio channel, magnetic bearing, and the distance in nautical miles to the transmitting antenna from the checkpoint marking. It provides aircrew members with operational check information on the navigation equipment of the aircraft.

13466-2     **REQUIREMENTS.** The character height shall not be less than 0.18 meters (7 inches) or more than 0.20 meters (8 inches) high and the stroke width of not less than 0.03 meters (1 inch). The sign should have black characters on a yellow background and be similar in shape and color when lighted at night and unlighted during the daytime.

13466-3     **SITE PLANNING.** Check signs are planned for all runway ends at each air installation equipped with a tactical air navigation (TACAN), visual omni-directional range (VOR), or combined (VORTAC) installation.

### 134 70    **RADAR TOWER (EA)**

**FAC: 1341**

**BFR Required: N**

**Design Criteria:** None Available.

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13470-1     **REQUIREMENT.** Radar towers must be planned on an individual basis.

### 134 71    **AVIATION METEOROLOGICAL FACILITY (EA)**

**FAC: 1341**

**BFR Required: Y**

13471-1     **DEFINITION.** An AVI meteorological facility is a weather forecasting facility that supports air operations.

13471-2     **GENERAL.** . An engineering analysis is required to determine facility space allocations.

## 135        **COMMUNICATION LINES**

### 135 10    **COMMUNICATION LINES OTHER THAN TELEPHONE (MI)**

**FAC: 1351**

**BFR Required: N**

13510-1     Communication lines provide circuits between the various activities on or off the station. The communications net may include trunk line service cable, feeder lines, and direct circuits depending on the complexity of the system.

**135 11 FIBER OPTIC COMMUNICATIONS LINES, UNDERGROUND  
IN CONDUIT (MI)**

**FAC: 1351**

**BFR Required: N**

13511-1 **DEFINITION.** The communications lines are non-armored OM-2 Singlemode Fiber Optic cables installed inside an underground duct.

**135 12 FIBER OPTIC COMMUNICATIONS LINES, NON-CONDUCTIVE RISER  
RATED (EA)**

**FAC: 1351**

**BFR Required: N**

13512-1 **DEFINITION.** The communications lines are non-armored OM-3 multimode Fiber Optic cables installed inside and underground duct.

**135 13 FIBER OPTIC COMMUNICATIONS LINES, OUTSIDE PLANT,  
ARMORED (MI)**

**FAC: 1351**

**BFR Required: N**

13513-1 **DEFINITION.** These communications lines are singlemode or multimode or mixed mode fiber rated for indoor and outdoor use for campus and/or building backbone installed in riser, conduit, and ducts or direct buried.

**135 15 OPTICAL GROUND WIRE (MI)**

**FAC: 1351**

**BFR Required: N**

13515-1 **DEFINITION.** Optical ground wire is for electrical power and optical communication between power substations in support of relay interconnects.

**135 20 TELEPHONE LINES (MI)**

**FAC: 1351**

**BFR Required: N**

13520-1 No specific criteria are available.

**135 21 FIBER OPTIC COMMUNICATIONS LINES, OUTSIDE PLANT, MARINIZED  
(UNDERWATER/WETLAND) (MI)**

**FAC: 1351**

**BFR Required: N**

13521-1 **DEFINITION.** The communication lines are underwater grade reinforced composite fiber cable used in aquatic conditions.

**135 31 COPPER COMMUNICATIONS LINES, OUTSIDE PLANT, GEL FILLED (MI)**

**FAC: 1351**

**BFR Required: N**

13531-1 **DEFINITION.** These types of communications lines are for indoor and outdoor use for campus and/or building backbone copper cable installed in riser, conduit, and ducts or direct buried.

**135 32 COPPER COMMUNICATIONS LINES, OUTSIDE PLANT, AIR CORE (MI)**

**FAC: 1351**

**BFR Required: N**

13532-1 **DEFINITION.** These types of communications lines are annealed reinforced composite copper cable used with air compressors to support continual drying.

**135 33 COPPER COMMUNICATIONS LINES, OUTSIDE PLANT, MARINIZED (UNDERWATER/WETLAND) (MI)**

**FAC: 1351**

**BFR Required: N**

13533-1 **DEFINITION.** These types of communications lines are underwater grade reinforced composite copper cable used in aquatic conditions.

**135 34 COPPER COMMUNICATIONS LINES, OUTSIDE PLANT, ARMORED (MI)**

**FAC: 1351**

**BFR Required: N**

13534-1 **DEFINITION.** These communications lines are bulk copper cable designed for direct burial condition installed directly in or above ground without conduit.

## **136 AIRFIELD PAVEMENT LIGHTING**

136-1 **DEFINITION.** Airfield pavement lighting includes facilities for lighting all airfield pavements and approaches thereto. The purpose of this section is to provide the general requirements for airfield Visual Landing Aids for approaches, landings, takeoffs, taxiing, and surface maneuvering of aircraft on Navy and Marine Corps airfields. The visual landing aids include lighting and markings. The various lighting systems are planned with regard to other airfield related facilities so that integrated control is

achieved and the resultant overall lighting system is compatible with the operational mission of the air installation.

136-2 **CONDITIONS.** Based on missions assigned by CNO, lighting facilities are developed to meet Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) conditions as defined in NAVAIR 51-50AAA-2 as follows:

136-2.1 **Visual Flight Rules (VFR).** These are rules which govern the procedures for conducting flights under visual conditions. The minimum conditions in which VFR operations are permitted is a minimum cloud ceiling height of 304.8 meters (1,000 feet) and ground visibility of 4.83 km (3 miles).

136-2.2 **Instrument Flight Rules (IFR).** These are rules governing procedures for conducting instrument flight. IFR flight operations are dependent upon pilots' use of instrument guidance. As a ceiling becomes lower or the visibility more restrictive, the more precise the electronic and visual guidance must be as required for the following categories:

- (1) Non-precision IFR: IFR operations that use non-precision electronic aids (TACAN, VORTAC, etc.) to provide directional guidance for straight-in approaches to a Minimum Descent Altitude (MDA) as low as 79.2 meters (260 feet) and 1.61 km (1 mile) visibility or 1,250 meters (5,000 feet) Runway Visual Range (RVR).
- (2) Precision IFR, Category I: Requires precision electronic aids (ILS, PAR, or MLS) and visual aids for approach minimums of 60.9 meters (200 feet) Decision Height (DH) and 732 meters (2,400 feet) (some cases 488 meters (1,600 feet)) RVR.
- (3) Precision IFR, Category II: Requires precision electronic aids (precision ILS or MLS) and visual aids for approach minimums of 30.5 meters (100 feet) DH and 366 meters (1,200 feet) RVR.
- (4) Precision IFR, Category IIIA: Requires precision electronic aids (precision ILS or MLS) and visual aids for approach minimums of 0 meters (0 feet) DH and 213 meters (700 feet) RVR.
- (5) Precision IFR, Category IIIB: Requires precision electronic aids (precision ILS or MLS) and visual aids for approach minimums of 0 meters (0 feet) DH and 45.7 meters (150 feet) RVR.
- (6) Precision IFR, Category IIIC: Requires precision electronic aids (precision ILS or MLS) and visual aids for approach minimums of 0 meters (0 feet) DH and 0 meters (0 feet) RVR.

136-3 **REQUIREMENTS.** The types of approach visual aids required for an airfield depend on the kind of flight operations that will be performed. Flight operations are separated into VFR and IFR. Major airfields usually have both types of operations.

136-3.1 **Approach Visual Aids.** Approach visual aids associated with the different flight rules are indicated in Table 136-1.

**Table 136-1. Approach Visual Aids Requirements**

Visual Aids System		Authorized Operations						
		VFR	IFR Category					
			Non-Prec	I	II	IIIA	IIIB	IIIC
136-10	ALSF-1	NR	NR	R	NR	NR	NR	NR
136-10	ALSF-2	NR	NR	NR	R	R	R	R
136-10	MALSR	RS	RS	-	-	-	-	-
136-10	SALS	NR	RS	NR	NR	NR	NR	NR
136-30	Circling Guidance Lights	RS	RS	NR	NR	NR	NR	NR
136-60	REIL	C	C	-	NR	NR	NR	NR

C = Recommended  
 R = Required. These visual aids are required for operating in the IFR Category, but other factors may negate approval for installation.  
 RS = Required under special conditions.  
 NR = Not required.

136-3.2 **Runway Approach Visual Aids.** The runway visual aids consist of markings and lighting installed near the runway. The runway lights include basic edge lights, low-intensity runway lights, and supplemental runway lights. The basic runway lights define the limits of the runway surface. These are edge lights, threshold lights, and runway end lights. Some runways may have displaced threshold lights and markings. The low-visibility runway lights are the centerline and touchdown zone lights. The supplemental runway lights may be runway exit lights, runway distance markers, and arresting gear markers. The configuration of the markings differs for the class of runway. The marking and types of lights may be different for runways on the same airfield. Runway visual aids associated with different flight rules are shown in Table 136-2.



**Table 136-2. Runway Approach Visual Aids Requirements**

Visual Aids System		Authorized Operations						
		VFR	IFR Category					
			Non-Prec	I	II	IIIA	IIIB	IIIC
	Runway Markings	R	R	R	R	R	R	IN
136-30	Runway Edge Lights (HIRL)	R	R	R	R	R	R	IN
136-30	Runway Edge Lights	R	R	R	R	R	R	IN
136-35	Runway Centerline Lights	NR	C	C	R	R	R	IN
136-55	Touchdown Zone Lights (TDZL)	NR	NR	OPT	R	R	R	IN
136-60	Displaced Threshold Lights and Markings	RS	RS	RS	RS	RS	RS	IN
136-60	Runway Threshold Lights and Markings	R	R	R	R	R	R	IN
<p>C = Recommended</p> <p>R = Required. These visual aids are required for operating in the IFR Category, but other factors may negate approval for installation.</p> <p>RS = Required under special conditions.</p> <p>OPT = Option as recommended by Air Station Commander and approved by NAVAIRSYSCOM.</p> <p>IN = Installation necessary.</p> <p>NR = Not required.</p>								

**136-3.3 Taxiway Visual Aids.** The taxiway lights and markings identify the area as a taxiway, define its limits, and provide directional guidance for maneuvering aircraft. The signs provide information on routes to taxi destinations and identify areas along the taxi route. Taxiway markings are painted on the paved surfaces and include centerline, edge, holding position, and checkpoint markings. The taxiway lights include either edge lights, centerline lights, or a combination of both lights, and

in some cases holding position lights. Taxiway guidance signs provide mandatory information that the pilot must recognize because of the existence of potential hazards. Also, general information is provided that assists the pilot in proceeding along the proper taxi route. Special signs may provide checkpoint information or routing information at complex intersections. The locations, types, and information on the signs vary for each taxiway. Taxiway visual aids associated with different flight rules are shown in Table 136-3.

**Table 136-3. Taxiway Visual Aids Requirements**

Visual Aids System	Authorized Operations						
	VFR	IFR Category					
		Non-Prec	I	II	IIIA	IIIB	IIIC
Taxiway Markings	R	R	R	R	R	R	R
Taxiway Edge Lights	R	R	R	R	C	C	C
Taxiway Centerline Lights, Intersections	NR	OPT	C	C	R	R	R
Taxiway Centerline Lights, Continuous	NR	NR	OPT	C	R	R	R
Taxiway Guidance Signs	RS	C	R	R	R	R	R
Special Signs (TACAN)	RS	RS	RS	RS	RS	RS	RS
Special Signs, Billboards	RS	RS	RS	RS	RS	RS	RS
Holding Position Signs	C	R	R	R	R	R	R
Holding Position Lights	RS	RS	RS	RS	RS	RS	RS
Taxiway Lights for Runways Used as Taxiways	RS	RS	RS	RS	RS	RS	RS
C = Recommended R = Required. RS = Required under special conditions. OPT = Option as recommended by Air Station Commander and approved by NAVAIRSYSCOM. NR = Not required.							

**136-3.4 Special Considerations.** The following airfield lighting requirements are determined by individual airfield needs as described under the referenced Category Code:

Approach Lighting	136 10
Apron and Parking Area Lighting and Markings	136 20
Runway Edge Lighting and Markings and Circling Guidance Lights	136 30
Runway Centerline Lighting and Markings	136 35
Simulated Carrier Deck Lighting and Markings	136 36
Wheels-Up/Wave-Off Lighting	136 45
Taxiway Lighting and Markings	136 50
Touchdown Zone Lighting and Markings	136 55
Threshold Lighting and Markings	136 60
Heliport Lighting and Marking Systems	136 65

Obstruction lighting, beacons, and other visual navigation and traffic aids are discussed under basic Category Code series 134. For airfield perimeter lighting, street lighting, and other general illumination, see Basic Category Code series 812, Electric Power – Transmission and Distribution Lines.

**136 10 APPROACH LIGHTING (M/LF)**

**FAC: 1361**

**BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13610-1 **DEFINITION.** Approach lighting enhances the aircrew’s ability to acquire the runway environment visually when making an approach for landing during periods of reduced visibility. Visual cues for directional and roll guidance are provided to the aircrew for operations at night and in marginal weather conditions by day. The system includes both approach lights and sequenced flashers.

Approach lighting is provided for primary instrument approach runways. Planning of Category I, Category II, or Category III approach lighting systems is accomplished in accordance with mission requirements as listed in Basic Category 136. With sufficient justification approach lighting may also be authorized for other runways.

13610-2 **CONSIDERATIONS.** Factors to be considered in the justification of any approach lighting system include, but are not limited to:

- Existing and desired precision approach minimums.
- Number of actual instrument approaches.
- Climatology.
- Surface features, obstructions and feasibility of construction.

13610-3 **REQUIREMENTS.** Approach lights fall into three categories:

13610-3.1      **High Intensity Approach Lighting System (ALSF-1).** The High Intensity Approach Lighting System, ALSF-1, is a system of light bars and barrettes in the approach zone immediately ahead of the runway threshold. The standard length of an ALSF-1 is 914 meters (3,000 feet) unless terrain or other local conditions prevent a full length installation. Then the length may be shortened to not less than 732 meters (2,400 feet). This shorter system can impact landing minimums. Approval from NAVAIRSYSCOM is required for systems shorter than 914 meters (3,000 feet). Systems that are between 427 meters (1,400 feet) and 701 meters (2,300 feet) are called Short Approach Lighting Systems (SALS). The ALSF-1 consists of centerline lighting barrettes, sequencing flashing lights, 305 meters (1,000 foot) crossbar, terminating bar, pre-threshold wing bars, and threshold lights (Category Code 136 60). The standard system extends from the threshold 914 meters (3,000 feet) into the approach area of the runway. A barrette is three or more lights closely spaced in a transverse line so that from a distance they appear as a single short illuminating bar. For the ALSF-1, the length of the barrette shall not exceed 4.57 meters (15 feet) and the center-to-center spacing of the lights shall not exceed 1.52 meter (5 feet).

13610-3.2      **High Intensity Approach Lighting System (ALSF-2).** The High Intensity Approach Lighting System, ALSF-2, is a system of light bars and barrettes in the approach zone immediately ahead of the runway threshold. This approach lighting system is intended for use where operation during Category II instrument flight conditions or lower weather minimums are required. The standard length of an ALSF-2 is 914 meters (3,000 feet) unless terrain or other local conditions prevent a full length installation. Then the length may be shortened to not less than 732 meters (2,400 feet). The plan for the ALSF-2 consists of centerline lighting barrettes, sequencing flashing lights, 305 meters (1,000 foot) crossbar, 152 meter (500 foot) crossbar, side row barrettes, and threshold lights (Category Code 136 60). A barrette is three or more lights closely spaced in a transverse line so that from a distance they appear as a short illuminating bar. For the ALSF-2, the length of the barrette shall not exceed 4.57 meters (15 feet) and the center-to-center spacing of the lights shall not exceed 1.52 meter (5 feet).

13610-3.3      **Medium Intensity Approach Lights (MALSR).** The MALSR is a medium intensity approach lighting system with runway alignment indicator lights. It is intended for installation at Naval airfields only in support of Visual Flight Rules (VFR) or non-precision instrument approaches where installation costs are a factor. The standard system consists of centerline lights, a 305 meters (1,000 foot) crossbar, and sequenced flashing lights. The centerline is coincident with the extended runway centerline. The overall system is 732 meters (2,400 feet) long, but may be shortened to as little as 427 meters (1,400 feet) where space or construction problems arise. Where systems are shortened to less than 610 meters (2,000 feet), flashers will be added to steady burning light stations to provide a minimum of three flashing lights.

**136 20 APRON AND PARKING AREA LIGHTING AND MARKINGS (M/LF)****FAC: 1361****BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13620-1 **DEFINITION.** Apron and parking area lighting enables the aircrew to guide their aircraft into position for loading, servicing, or parking and provides illumination to perform such functions as fueling, maintenance, loading, unloading, and security.

13620-2 **APRON MARKINGS.** Apron markings are the basic visual aid for taxiing in the apron area during daylight and to supplement the lights during night operations and for all meteorological conditions. The markings provide visual cues to aircrews for taxiing through a complex or congested area between the end of the taxiway and the final position for parking the aircraft. This area includes terminals, hangars, service areas, and taxiways. The apron markings include taxiway centerline and edge markings, shoulder or deceptive area markings for paved areas not intended for aircraft traffic, parking area markings, and special markings to identify destinations or to provide specific information.

13620-3 **APRON LIGHTING.** Lighting of apron and parking areas is accomplished by a combination of high and surface mounted floodlights and roadway luminaries. Apron and parking area lighting is provided at all air installations where night or all weather operations are conducted. The overall lighting scheme is developed after a study of the functions to be performed and the physical layout of pavements and structures of the particular airfield.

**136 30 RUNWAY EDGE LIGHTING AND MARKINGS AND CIRCLING GUIDANCE LIGHTING (M/LF)****FAC: 1361****BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13630-1 **DEFINITION.** This Category Code includes two groups of lights, Runway Edge Lights, which define the lateral limits of the pavement, and Circling Guidance Lights (CGLs), which enable an airborne aircrew to locate the runway while off to the side of the runway, and establish the proper traffic pattern.

13630-2 **RUNWAY EDGE LIGHTING SYSTEM.** Runway edge lighting consists of three types of lights including: Low Intensity Runway Edge Lights (LIRL); Medium Intensity Runway Edge Lighting (MIRL); and High Intensity Runway Edge Lighting (HIRL). Runway edge lights are installed parallel to the runway centerline for the length

of the runway. The intensity of edge lighting used depends upon dominant weather conditions over the airfield. Each type of runway edge lights defines the lateral limits of the usable runway surface for landings and takeoffs during nighttime operations and in reduced visibility. The runway edge lighting is a basic airfield lighting system. With its associated Threshold Lighting, Category Code 136 60, and runway end lighting, it can function without other lighting support. All runways intended for use at night or during Instrument Flight Rules (IFR) operations require edge lighting.

Edge lighting systems consists of two straight lines of lights with one line of lights located along each edge of the runway. The lights are equally spaced along the edge of the runway, bi-directional, and the emitted color shall be aviation white. For runways with displaced thresholds, edge lighting is installed at the edges of the displaced area if this area is used for rollouts and takeoffs. Edge lighting located in the displaced threshold area the color of the emitted light towards the approach zone shall be aviation red.

13630-2.1       **Edge Lights.** Runway edge lights are white lights equally spaced on each side of the runway with a maximum interval of 61 meters (200 feet). Runway edge lights are installed to provide visual guidance during takeoff and landing operations at night and under low visibility conditions. Requirements are expressed in terms of runway length; that is, runway lights programmed for a runway 3,200 meters (10,500 feet) long will be shown as 3,200 meters (10,500 feet) of runway lights. Consult NAVAIR 51-50AAA-2 for layout and spacing requirements.

13630-2.2       **Edge Markings.** Runway edge markings are continuous lines near each edge of the runway parallel to the runway centerline. The stripes are 0.914 meters (3 feet) wide. For runways 61 meters (200 feet) or less in width, the outer edge of these stripes shall be 0.61 meters (2 feet) from the nominal or designated edge of the runway. For runways more than 61 meters (200 feet) wide, the inner edges of the markings are 58 meters (190 feet) apart and symmetrical about the runway centerline. If the runway has a displaced threshold, the side stripes continue through the displaced section. Preferably, the edge markings extend to the runway ends but may terminate with the beginning of the threshold markings except where the threshold is displaced from the runway end. The color of the edge markings is retro-reflective white. Consult NAVAIR 51-50AAA-2 for layout and spacing requirements.

13630-3       **CIRCLING GUIDANCE LIGHTS.** Circling Guidance Lights (CGLs) are two straight lines of white lights with one line on each side of the runway with the beam emitted perpendicular to and away from the runway centerline. GCLs have a nominal 305 meter (1,000 foot) spacing and are placed outboard of the runway edge in line with the Runway Distance Markers, Category Code 134 64. They are used only for visual flight operations where conditions around the air installation, such as a metropolitan area or smog, confuse or obscure the runway when viewed from a circling aircraft. The need for circling guidance lights at a given air installation is determined by the particular airfield environment. Circling guidance lights requirements are also expressed in feet of runway length. Consult NAVAIR 51-50AAA-2 for layout and spacing requirements.

**136 35 RUNWAY CENTERLINE LIGHTING AND MARKINGS (M/LF)****FAC: 1361****BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Landbased Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13635-1 **RUNWAY CENTERLINE LIGHTING.** Runway centerline lighting provides visual aid to assist the aircrew in keeping the aircraft centered on the runway during take-off and after landing at night or in condition of reduced visibility. It is a supplement to Runway Edge Lighting and Markings and Circling Guidance Lighting, Category Code 136 30. White in-pavement lights are placed along the runway centerline at either 7.62 meter (25 foot) spacing of "tailhook resistant" lights or 15.2 meter (50 foot) spacing of standard duty lights. Lights are white when viewed from the landing threshold until the last 914 meters (3,000 feet) of the runway. The white lights alternate with red for the next 610 meters (2,000 feet), and are all red the final 305 meters (1,000 feet) in order to distinguish the runway's end.

13635-2 **REQUIREMENTS.** Runway centerline lighting is planned in accordance with mission requirements as listed in Basic Category Code series 136. Requirements are expressed in meters (feet) of runway length vice the length of the lighting circuit. Consult NAVAIR 51-50AAA-2 for layout and spacing requirements.

13635-3 **RUNWAY CENTERLINE MARKING.** Runway centerline markings are centered on the runway centerline. The markings are a broken line of 36.6 meters (120 foot) long stripes separated by blank spaces of 24.4 meters (80 feet) +/- 3.05 meters (10 feet). The first stripe from each end is 12.2 meters (40 feet) from the top of the designation number. The minimum width of stripes is 0.305 meters (1 foot) wide for basic runways and a minimum of 0.914 meters (3 feet) wide from other runways. The color of these markings is retro-reflective white.

**136 36 SIMULATED CARRIER DECK LIGHTING (EA)****FAC: 1362****BFR Required: Y**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13636-1 **DEFINITION.** A simulated carrier deck is used to train pilots ashore for landing aircraft under simulated conditions of a carrier at sea. Simulated carrier deck lighting and markings permits training during the day, night, and adverse visibility conditions.

13636-1.1 **Lighting.** The carrier deck lighting consists of centerline lights, edge lights, and athwartship lights. The edge and athwartship lights form a 21.3

meter by 228 meter (70 foot by 748 foot) rectangle outlining the simulated carrier deck that is on the left side of the runway, as seen from the landing aircraft, and approximately 98 meters (320 feet) beyond the runway threshold. An Optical Landing Aid, Category Code 134-60, and Landing Signal Officer (LSO) station is also required. Consult NAVAIR 51-50AAA-2 for layout and spacing requirements.

13636-1.2 **Markings.** The simulated carrier deck markings supersede the standard runway markings, including the unpainted areas within the deck boundaries and are symmetrical about the designated deck centerline. The markings are painted on the runway surface. If the contrast of the markings against the runway is poor, the markings may be outlined with a lusterless black border. The markings shall consist of centerline markings, edge markings, and ramp athwartship markings. There is no athwartship line at the forward end of the deck. Consult NAVAIR 51-50AAA-2 for layout and spacing requirements.

13636-2 **REQUIREMENTS.** Simulated carrier deck lighting is required at all air installations designed by the Chief of Naval Operations (CNO) for Fleet Carrier Landing Practice (FCLP). Normally two sets are installed per runway, one at each end of the runway selected for FCLP.

### **136 45 WHEELS-UP/WAVE-OFF LIGHTING (M/LF)**

**FAC: 1362**

**BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13645-1 **DEFINITION.** Wheels-Up and Wave-Off Lights are provided to allow either the Wheel Watch, the Landing Signal Officer (LSO), or Control Tower personnel to determine if a landing aircraft has its landing gear fully extended and/or to signal to an aircrew to abort or “wave-off” a landing attempt.

13645-2 **REQUIREMENTS.** Wheels-up lights are a bar of 20 white lights installed under the approach path that are aimed upward and toward the threshold. They are intended to illuminate the underside of landing aircraft to permit observers to determine that the landing gear is fully lowered. The system also includes a pad for siting a portable Wheels Watch Shelter, Category Code 133-80. The light bar is placed 264 meters (980 feet) +/- 1.54 meters (5 feet), from the threshold under the approach path and on the same side of the extended runway centerline as the Control Tower.

Wave-off lights are used to signal to the aircrew to abort or “wave off” a landing attempt. Six pairs of flashing red lights, three pairs on each side of the runway, spotted 3.05 meters (10 feet) outboard of the runway edge at 270 meters, 510 meters, and 750 meters (900 feet, 1,700 feet, and 2,500 feet) from the runway threshold that are activated by either the Wheels Watch or Control Tower personnel. The lights flash when activated.



**136 50 TAXIWAY LIGHTING AND MARKINGS (M/LF)****FAC: 1361****BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13650-1 **DEFINITION.** Taxiway lighting and markings define the lateral limits and direction of a Taxiway, Category Code 112-10, to guide aircraft movement between the runway operational area and the aircraft parking area during night operations or conditions of poor visibility.

13650-2 **TAXIWAY LIGHTING SYSTEM REQUIREMENTS.** Taxiway lighting requirements are expressed in meters/feet of lighted taxiway length, not in length of lighting circuit. The total length of taxiway lighting is dependent upon the length of the taxiway itself, its turn radii, and its number of intersections and holding positions. The amount of taxiway lighting is expressed in meters (linear feet). Included in this category are taxiway edge lights, taxiway centerline lights, hold lights and guidance signs.

13650-2.1 **Taxiway Edge Lights.** Taxiway edge lights are elevated or semi-flush blue lights located on each side of the taxiway at intervals delineated in NAVAIR 51-50AAA-2. This interval varies based on the length and turn radii of the taxiway. Therefore, the number of lights cannot be determined without first knowing the geometry of the taxiway and airfield. Consult NAVAIR 51-50AAA-2 for layout information. Taxiway edge lighting is planned for all air installations conducting all-weather or night operations.

13650-2.2 **Taxiway Centerline Lights.** Taxiway centerline lights are semi-flush green lights placed in the pavement on the centerline of the taxiway. They are used to add the directional guidance required at high speed taxiway exits. They are also used to supplement edge lights wherever more positive guidance of aircraft is necessary, such as at complex taxiway intersections or large ramp areas where pilot confusion might occur. Again, the number of taxiway lights cannot be determined without knowing the geometry of the airfield. Consult NAVAIR 51-50AAA-2 for layout and spacing requirements.

13650-2.3 **Hold Lights.** Hold lights are a group of three semi-flush lights centered about the taxiway centerline at the holding position marker. For wide taxiways, five lights may be used. If the taxiway has centerline lighting in the area where the holding position lights are to be installed, the holding position lights shall be the same type as the centerline lights except with yellow filters. For intersections without centerline lights, three yellow lights, located in the center of the taxiway, perpendicular to the aircraft's direction of travel, shall be aimed towards the holding position. Holding position yellow lights are used for night marking of the painted hold positions. Their position and location are based on operational requirements. Consult NAVAIR 51-50AAA-2 for layout information.

13650-2.4 **Guidance Signs.** Taxiway guidance signs are internally lighted signs used to supplement taxiway lighting systems. They are placed at intersections of runways, taxiways with runways, taxiways with aprons, taxiways with taxiways, at refueling stations, and generally where direction or location information is required. The number of signs is based on the particular airfield requirements and is kept to a minimum. Consult NAVAIR 51-50AAA-2 for sign height limitations and letter text size.

13650-3 **TAXIWAY MARKINGS REQUIREMENTS.** Taxiway markings consist of a system of markings identified by the functions which they serve. The elements of taxiway markings include: taxiway centerline markings (required); holding position markings (standard and Category II, required); runway entrance and exit markings (required); TACAN checkpoint markings (required, if established); edge markings (optional); shoulder markings (optional); hazardous area markings (optional); and closed taxiway markings (optional). The markings shall be painted of the specified color applied to the taxiway surface except temporary hazardous area markings may use flags or barrier markings. Also, temporary closed taxiway markings may be of materials such as tape of that color that can be easily removed.

Taxiway centerline markings are a contiguous retro-reflective yellow stripe not less than 0.152 meters (6 inches) wide located along the taxiway axis. If taxiway centerline lights are installed, the axis of the centerline stripe may be offset no more than 0.305 meters (1 foot) from the taxiway centerline to avoid painting over the lights. These markings provide identification of a taxiway and longitudinal guidance for steering the aircraft. The markings continue across the intersecting taxiways or curve into the intersecting taxiway to indicate turns that are frequently used in taxiing. On curves or curved sections the markings are smooth curves and the minimum distance from the edge of the taxiway is not less than one-half the width of the taxiway. Consult NAVAIR 51-50AAA-2 for layout information.

13650-4 **SPECIAL SITUATIONS.** The use of runways as taxiways should be avoided; however, where the existing airfield layout requires the use of the runway as a taxipath, separate taxiway fixtures and circuits, in addition to the runway lighting system, are used. Consult NAVAIR 51-50AAA-2 for lamp layout and spacing.

## **136 55 TOUCHDOWN ZONE LIGHTING AND MARKING (M/LF)**

**FAC: 1362**

**BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13655-1 **LIGHTING REQUIREMENTS.** Touchdown zone lighting delineates the touchdown zone on the runway and provides directional and roll guidance for aircraft approaching the threshold. It provides visual cues for more accurately centering the aircraft on the runway, adjusting attitude for touchdown, and determining the touchdown

position. The lighting consists of bars of white lights in the pavement on each side of the runway centerline. Thirty pairs of bars are spaced along the runway at 30.5 meters (100 foot) intervals for a total distance of 914 meters (3,000 feet). Touchdown zone lighting is planned in accordance with mission requirements as listed in Basic Category Code group 136. A set of lights is required only on the end of the runway with approach lighting.

**13655-2 MARKING REQUIREMENTS.** Touchdown zone markings consist of groups of three, two, and one rectangular bars symmetrically arranged impairs about the runway centerline. Each bar is 1.83 meters (6 feet) wide and 23.4 meters (75 feet) long. The bars within a group are spaced 1.52 meters (5 feet) apart. The second group of bars from the threshold shall be fixed distance markings as single bars 9.14 meters (30 feet) wide and 45.7 meters (150 feet) in length. For runways less than 45.7 meters (150 feet) wide, the width of the bars and spaces is reduced proportionately. The inner edges of the bars in a pair are 22 meters (72 feet) apart. The first pair of bars begins 152 meters (500 feet) down the runway from the beginning of the threshold markings (159 meters (520 feet) from the runway end).

On shorter runways, these pairs of bars that would extend to within 274 meters (900 feet) of the midpoint of the runway are eliminated. The color of touchdown zone markings is retro-reflective white. Consult NAVAIR 51-50AAA-2 for layout and spacing requirements.

## **136 60 THRESHOLD LIGHTING AND MARKINGS (EA)**

**FAC: 1362**

**BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

**13660-1 THRESHOLD LIGHTING.** Threshold lighting is a system of lights defining the ends of the usable runway surface. They include threshold lights, displaced threshold lights, Runway End Identification Lights (REIL) and runway end lights. The threshold lights are displaced from the extremity of the runway when a portion is unavailable for normal operations. REIL and runway end lights enable a pilot to positively identify the ends of the runway from a distance during night-non-precision approach operations.

**13660-1.1 Threshold Lights.** Threshold lights are installed to provide positive identification of the beginning of the operational runway surface for approaching aircraft at night or under Instrument Flight Rules (IFR) conditions. Threshold lighting consists of two groups of lights located symmetrically about and perpendicular to the runway centerline at each end of the runway, both inboard and outboard of the line of the runway edge lights. The lights show green toward the approach zone and, if at an extremity, red toward the runway. Threshold lights are planned for all lighted

runways, but more lights are required where an approach lighting system is used as displayed in NAVAIR 51-50AAA-2.

13660-1.2 **Displaced Threshold Lights.** Displaced threshold lighting is used only if a portion of the end of the runway is unusable for landing but is available for rollout and takeoff. When this condition exists because of obstructions or other reasons, the lighting is modified to delineate the extent of runway which is available to aircraft approaching from either direction. This is accomplished by displacing and changing the threshold lights to indicate the new threshold location for landing aircraft and equipping the intervening runway edge lights with filters.

13660-1.3 **Runway End Identification Lights (REIL).** REIL consist of two synchronized flashing lights near the runway threshold to provide rapid and positive identification of the approach end of a runway. These lights have been adopted to replace the obsolete runway identification lights formerly employed as the standard.

13660-1.4 **Runway End Lights.** Runway end lights are installed to define the end of the operational runway for aircraft on landing rollout and takeoff. A minimum of ten red lights are arranged in two groups symmetrical about and perpendicular to the runway centerline pointing toward the runway side of the threshold at each end of the runway. Intervals between lights in each group are not to exceed 3.05 meters (10 feet). They are to be positioned not more than 1.52 meters (5 feet) beyond the length of usable pavement and the outboard most light in each group will be in the line of the runway edge lights. Where runway end lights and threshold lights are to be installed in the same location, bi-directional red/green lights may be used with the appropriate color lens. If located at the end of usable pavement in displaced threshold areas, they are bi-directional red.

13660-2 **THRESHOLD MARKING.** Threshold markings consist of ten stripes, five on each side, parallel and symmetrical about the runway centerline. The color of these markings is retro-reflective white. If the runway is less than 61 meters (200 feet) wide, the overall width of the threshold markings is 6.1 meters (20 feet) less than the runway width. The width of the stripes and spaces between the stripes is reduced proportionately. Consult NAVAIR 51-50AAA-2 for layout and spacing requirements.

## **136 65 HELIPORT LIGHTING AND MARKING (M/LF)**

**FAC: 1361**

**BFR Required: N**

**Design Criteria:** NAVAIR 51-50AAA-2, Visual Landing Aids Design Standards, Land-based Installations

**Planning Criteria:** P-80.3, Airfield Safety Clearances (Facility Planning Factor Criteria for Navy and Marine Corps Shore Installations, Appendix E)

13665-1 **DEFINITION.** Heliport lighting is a system of lights arranged to clearly define the helicopter landing pad for operations at night and during periods of poor visibility. Heliport lighting includes all visual reference aspects of the approach and

landing of rotary wing aircraft. This includes visual aids, markings, perimeter and approach lights, and runway and taxiway lights.

13665-2 **REQUIREMENTS.** The basic heliport lighting requirement is perimeter lighting and landing direction lights. Approach direction lights and depth perception lighting may also be required. Perimeter lighting and landing direction lights are planned for all helicopter pads designated for night or all-weather operations and when authorized as an operational requirement at a specific location. Landing direction lights are used to indicate a preferred landing direction and to give side orientation as wing bars. Approach direction lights are added if additional approach guidance is required. The need for depth perception lighting (pad inset lights and/or flood lights) is determined by heliport location, steepness of approach, and prevailing environmental conditions.

Heliport lighting and marking systems are comprised of numerous types of pavement markings and lighting systems. They include:

13665-2.1 **Helipad Identification Markings.** Included in this category are identification markings and perimeter markings. Helipad identification marking for a paved helipad shall be a capital letter "H". The "H" marking shall be located in the center of the landing area, and oriented with the preferred approach direction. The dimensions shall vary with size of the landing and takeoff area. The color of the "H" is aviation white, and must be reflective if the pad is used at night. If the paved surface is a light color and improved contrast is needed, the identification marker shall be outlined with a lusterless black border. Perimeter markings define the safe landing area and are oriented with the sides of the parallel square to the letter "H". The perimeter markings consist of the corners and edge bars. The corners form right angles and the edge bars are located midway between the corner markings. The outer edges of the markings are the designated limits of the landing and takeoff area. These markings are aviation white and if the helipad is used at night shall be reflective. Again, if contrast is needed, these markings will be outlined with a black border.

13665-2.2 **Helipad Perimeter Lights.** Helipad perimeter lights consist of a row of lights along or near the four sides of a helipad. Typically, these lights are elevated although semi-flush lights may be used in areas where helicopters with wheels may be taxiing on the surface between the helipad and parking or service areas. Both type of fixtures emit omni-directional yellow light.

13665-2.3 **Helipad Approach Lights.** Helipad approach lights consist of a row of landing direction lights perpendicular to the centerline of the perimeter lights, beginning approximately 7.62 meters (25 feet) from the midpoint of the perimeter light centerline. These lights are usually elevated although semi-flush lights may be use in areas where helicopters with wheels may be taxiing on the surface. These lights emit omni-directional beams. The helipad approach light system entails two types of lights. The first are Landing Directional Lights. These consist of a single row of six yellow lights outward from the helipad perimeter lights centered on the helipad in the established direction for the approach. The second type of light is the Approach Direction Lights. This system is comprised of two parallel rows of lights

extending outward from the last landing direction light. Each row shall have five pairs of white lights.

13665-2.4 **Heliport Runway Lights.** Heliport runway lights are required for runways doing night operations. Yellow lights define the limits of the runway and are spaced at 4.57 meter (15 foot) intervals at the line of perimeter lights and extend outward in the direction of the preferred approach/takeoff path. These lights are an optional feature that is installed when it is necessary to provide directional guidance.

13665-2.5 **Heliport Taxiway Lights.** Heliport taxiways are defined while flush mounted green lights along the taxiway centerline. Blue omni-directional lights define taxiway route edges. The lights are spaced at 7.62 meter (25 foot) intervals on straight sections. On curves, this distance should remain the same; however, there must be at least four lights defining the turn.

## 137 SHIP NAVIGATION AND TRAFFIC AIDS-BUILDINGS

137-1 This code group applies to buildings for housing sea traffic control, navigation aids and navigation services.

### 137 10 METEOROLOGY AND OCEANOGRAPHY BUILDING (SF) [DELETE]

**FAC: 1371**

**BFR Required: Y**

13710-1 This category is deleted. All future requirements should be reassigned, revised, and calculated as a Category Code 13115 "Communications, Information, or Intelligence Analysis Facility".

### 137 20 LIGHTHOUSE (M2/SF)

**FAC: 1371**

**BFR Required: Y**

13720-1 **DEFINITION.** A lighthouse is a structure that houses a navigation beacon that may emit light, sound, radio, radar, or a combination thereof. It may be onshore or offshore. Construction is done overseas when appropriate by the Naval Facilities Engineering Command.

13720-2 **REQUIREMENTS.** Criteria are supplied by the U.S. Coast Guard. See UFC 4-141-10N for details.

## 138 SHIP NAVIGATION AND TRAFFIC AIDS-OTHER THAN BUILDINGS

138-1 This code group applies to structures which function as sea traffic navigation/traffic aids.

### 138 10 BEACON - SHIP (EA)

**FAC: 1381**

**BFR Required: N**

13810-1 **DEFINITION.** The U.S. Coast Guard has specific jurisdiction over all aids to navigation (day beacons, buoys, foghorns, etc.,) in the continental United States and in all outlying territories and possessions. Day beacons are unlighted structures used to mark isolated dangers or channels, edges, or alignment. They are painted white, black, green, or red, either separately or in combination. Day beacons also have reflectors for night use. See Harbor and Coastal Facilities, UFC 4-150-06, for technical information, and International Rules of Road and Inland Waterways, U.S. Coast Guard, for regulations.

### 138 20 NAVIGATION AID TARGET (EA)

**FAC: 1381**

**BFR Required: N**

13820-1 **DEFINITION.** This Category Code is to be used for navigational aid targets which are a part of maritime navigational aids.

13820-2 **REQUIREMENTS.** These facilities are planned on an individual basis.

### 138 25 ANTENNA-NAVIGATION (EA)

**FAC: 1381**

**BFR Required: N**

13825-1 **DEFINITION.** This Category Code is to be used for antennas or antenna systems which are a part of maritime navigational aids.

13825-2 **REQUIREMENTS.** These facilities are planned on an individual basis.

## 140 LAND OPERATIONAL BUILDINGS

## 141 OPERATIONAL - BUILDINGS

**141 11 AIR PASSENGER TERMINAL (SF)**

**FAC: 1412**

**BFR Required: Y**

14111-1 **DEFINITION.** The air passenger terminal provides facilities for processing authorized passengers and their baggage and for processing incidental freight. Space is provided in the terminal for the following functional areas: administrative space, baggage claim room, check-in counter, minor freight storage, information counter, and waiting lounge with food concessions. (For air cargo terminal, see Category Code 141 12.) The space to be planned is based on an analysis of the passenger traffic anticipated. A terminal is planned for those air stations where passenger traffic is projected to exceed 30 passengers during a typical peak hour.

14111-2 Due to the irregular and often unpredictable passenger flow in military air terminals, the facility requirements must be justified in each individual case where a terminal is warranted. Supporting data must include historic passenger flow figures and mode in sufficient detail to permit validation of facility scope.

**141 12 AIR CARGO TERMINAL (SF)**

**FAC: 1412**

**BFR Required: Y**

14112-1 **DEFINITION.** An air cargo terminal is planned for air stations where cargo and freight handling exceeds 10,000 pounds per day. The air cargo terminal is separate from the air passenger terminal (Code 141 11) where only incidental freight is handled. Air cargo terminal functions include receipt of packages, control documentation, palletization, and holding for shipment, aircraft loading and unloading, package sorting, and loading on trucks.

14112-2 Space required for air cargo terminal operations is based on the weight of cargo to be handled as determined by station survey. Terminals are planned using the space allowances in Table 14112-1.

**Table 14112-1 Space Allowances - Air Cargo Terminal**

Average Daily Load (pounds) <sup>(1)</sup>	Air Cargo Terminal Type	Gross SF Area
10,000 - 20,000	Small, non-mechanical	7,720
20,000 - 40,000	Small, mechanical	32,500
40,000 - 100,000	Medium, mechanical	44,500
100,000 - 160,000	Large, mechanical	54,500

(1) Average Daily Load includes cargo originating, terminating, and being re-handled through the terminal.

14112-3 Air cargo terminal facilities must be adjacent to the transient aircraft apron area but siting shall not violate aircraft pavement clearance criteria. Exterior pavement requirements include road access, access to aircraft apron, and non-organizational vehicle parking area (see Category Code 852 10).



**141 20 AIRCRAFT FIRE AND RESCUE STATION (SF)****FAC: 1411****BFR Required: Y**

Refer to Design Criteria, UFC 4-730-10 Fire Stations, for technical requirements at <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-4-730-10>.

The Space Planning Spreadsheet is located at <https://www.wbdg.org/ffc/dod/unified-facilities-space-program-sustainability-spreadsheets>.

14120-1 **DEFINITION.** This space criteria applies to Installation fire and rescue facilities which provide fire protection and emergency rescue services for pilots and aircraft.

14120-1.1 When feasible, the aircraft fire and rescue station is combined with the structural fire station (Category Code 730 10) to develop the total space allocation for one complete emergency facility, Category Code 141 25 "Combined Structural / Aircraft Fire / Rescue Station".

14120-2 **REQUIREMENT.** The number of fire stations required on an Installation will be determined by the necessary response time for the type and function of facilities requiring fire protection. This analysis will be provided by Commander Navy Installations Command (CNIC) N30 or Marine Corps Installations Command (MCICOM) G3.

14120-3 **SCOPE.** Refer to CCN 730 10 for explanation of the scope, types, classes and function of the fire station facility.

14120-4.1 The total space allocation is based on the number of fire and rescue vehicles assigned to the aircraft fire and rescue function, at both the parent and outlying fields.

14120-2.2 Covered space, either building or shed, is provided for all assigned fire and rescue vehicles and equipment. Generally, the building element houses the active vehicles required to protect the parent Installation. The shed element houses: (1) the active foamer and crane, (2) the active vehicles to support the outlying fields, and (3) the spare vehicles for maintenance and reserve for both parent and outlying fields.

14120-4 **FUNCTIONAL AREAS.** Aircraft Fire and Rescue Stations consist of apparatus bays and support areas, equipment and gear storage areas (for fire extinguishers, self-contained breathing apparatus (SCBA), protective clothing, hoses, firefighting agents, etc.), dispatch office, administrative offices, training facilities, living quarters, recreation and dining facilities, and possibly an emergency operations center and/or apparatus and equipment maintenance areas (if required by Installation mission requirements).

14120-3 **SPACE ALLOWANCE.** The Total Gross Building area is determined using the space planning spreadsheet. This area will be the sum of the building and shed space allowance at both the parent and outlying field locations. The planner must account for all fire and rescue vehicles at the location and determine how many will be housed in the building and how many will be housed under sheds. The planner will reflect the following on the BFR: (1) the total shed area equals the number of vehicles housed in sheds times the area of the vehicle bays, and (2) the total building area is the Total Gross Building area minus the total shed area.

14120-3.1 Pavement is provided adjacent to the station for 25 percent of the vehicles and for one vehicle wash rack.

14120-3.2 The Fire and Rescue Vehicles Alert Pad is computed separately under Category Code 116 60.

**Figure 141-20 Sample Computation - Aircraft Fire and Rescue Station**

Assume an Air Station operates with outlying fields. The space planning spreadsheet has indicated that the Total Gross Building area is 11,700 GSF. The planner has determined that 40% of the fire and rescue vehicles will be housed in sheds, both at the parent and the outlying fields. The total shed requirement is 4,752 GSF, which is split into 2,160 GSF at the parent station and 2,592 GSF at the outlying fields. The building area will be 6,948 GSF. The total building and shed space sum up as follows:

	Building Area - GSF	Shed Area - GSF
Parent Station	6,948	2,160
Outlying Fields	0	2,592
<b>Total</b>	<b>6,948</b>	<b>4,752</b>
<b>Total Gross Building Area</b>	<b>11,700 GSF</b>	

The total space to show on the BFRL is  $6,948 + 4,752 = 11,700$  SF gross for the parent air station. No space to house the vehicles is required at any of the outlying fields.

**141 25 COMBINED STRUCTURAL / AIRCRAFT FIRE / RESCUE STATION (SF)**

**FAC: 1411**

**BFR Required: Y**

14125-1 **DEFINITION.** A combined structural/aircraft fire/rescue station is planned under certain conditions to serve the function of a structural fire station (Category Code 730 10) and an aircraft fire and rescue station (Category Code 141 20). The combined facility is planned for a location that satisfies the response time and distance requirements for both the structural fire and the aircraft fire and rescue stations.

14125-2 The station must provide adequate support of airfield activities and protection for all buildings and structures. The size of the building is planned to house the aircraft fire and rescue vehicles required plus the structural fire vehicles required. The computations are done as indicated in Category Codes 141 20, Aircraft Fire and Rescue Station, and 730 10, Fire Station. The sum of the areas required for the structural fire station and the aircraft fire and rescue station is the total building area for the combined station.

14125-3 Protection against structural fires may be provided in part or completely by community resources. The method for development of reciprocal agreements between Navy and a municipality for mutual fire protection may be found in NAVMATINST 11320.10.

### **141 30 AIRCRAFT LINE OPERATIONS BUILDING (SF)**

**FAC: 1412**

**BFR Required: Y**

14130-1 **DEFINITION.** The aircraft line operations building is a structure used to centralize ground operations of the flight line. The building is utilized in keeping of squadron daily flight books, aircraft status boards, and bulletin boards and as support for line operations personnel by providing shelter, a water cooler, and a chemical toilet. The aircraft line operations building is a standard 12- by 20-foot portable building with a building area of 240 square feet gross.

14130-2 One line operations building may be planned for each hangar module when the distance between the squadron's parked aircraft and the hangar is greater than 1,000 feet.

**NOTE: Criteria for this facility indicates that it is to be portable and therefore carried as collateral equipment, when acquired. Collateral equipment is not Class II real property and cannot be included in the real property inventory. However, this category code is being retained for real property inventory purposes since many of the existing facilities are not portable and accordingly must be reported in the RPI.**

### **141 40 AIRCRAFT OPERATIONS BUILDING (SF)**

**FAC: 1412**

**BFR Required: Y**

14140-1 **DEFINITION.** An aircraft operations building is planned for all Navy air stations, auxiliary air stations, and air facilities. The building houses the administration of flight operational activities with all supporting functions including flight control, communications, and weather services. The operations building adjoins the airfield control tower and the radar air traffic control center where siting requirements permit. See Table 14140-1 for space allowances.

**Table 14140-1  
Aircraft Operations Building**

Installation	Gross Area Sq. Ft.
Air Station	12,637
Air Facility	9,760

**141 41 MARINE AIR TRAFFIC CONTROL UNIT (MATCU)  
OPERATIONS BUILDING (SF)**

**FAC: 1412**

**BFR Required: Y**

14141-1 **DEFINITION.** The MATCU performs a combined function similar to that accomplished in Category Codes 134 40, Ground Control Approach (GCA) System; 133 25, TACAN Building; and 133 75, Air Surveillance Radar (ASR) Building. Depending on the level of aircraft operations, the MATCU operations building may provide the sole GCA support at an air installation or may supplement and be in addition to permanent ASR, TACAN, and GCA facilities. A MATCU operations building should not be planned without prior coordination with and approval of the Commandant of the Marine Corps (LFF-1).

14141-2 When authorized, the MATCU operations building shall not exceed 9,130 gross square feet.

**141 42 AIR INTELLIGENCE SUPPORT CENTER (SF)**

**FAC: 1444**

**BFR Required: Y**

14142-1 **DEFINITION.** This facility, also known as a Joint Intelligence Center (JIC), is used to store and disseminate classified material for mission planning, pilot training and briefings in support of attack aircraft operations. The design and size of the center will be determined by the type and amount of equipment to be installed and the number of standard attack squadrons assigned to a station. Typical spaces include: administrative, library/chart storage, classroom, special security office, planning rooms, briefing rooms, photo intelligence interpretation room and storage. No specific planning criteria are currently available for this facility. Inquiries regarding space allocations should be forwarded to OPNAV N2.

**141 60 VISUAL INFORMATION (VI) FACILITY (SF)****FAC: 1441****BFR Required: Y**

14160-1 **DEFINITION.** This category code was previously referred to as a "Photographic Building". Navy visual information (VI) is a professional visual communication capability closely associated with Navy public affairs (PA). The role of Navy VI is to support the following activity missions and functions:

- VI documentation (VIDOC), which includes combat camera (COMCAM ) documentation, operational documentation (OPDOC), technical documentation (TECDOC) and sub functions using graphic arts, motion media, still photographic, audio and other VI systems
- VI production in support of Navy operations, training, and other functions;
- Support of DoD records centers
- Ship/shore VI activities which include: motion media production, still photographic production, graphic arts production, and other VI services needed at ship/base level

A VI Facility is a building or a space within a building that houses an authorized VI activity, which is a function within an organization whose principal responsibility is to provide VI products and/or services and must meet specific requirements as described in OPNAVINST 3104.1A, Chapter 0201. All VI Activities must first be approved by CNO Office of the Assistant for Visual Information N09C2 and assigned a Defense Activity number (DVIAN) prior to establishing a VI facility. Requests for establishing or modifying Navy VI activities must correspond with the guidance for activity establishment or modification prescribed in OPNAVINST 5400.44 (5440.169D); and, must meet CA requirements prescribed in OPNAVINST 4860.7D.

14160-2 **ALLOWANCE.** The size of a VI Facility will be determined by an engineering analysis of the space required to support the VI activity mission, functions, and systems. Basic Facility Requirements (BFR) creation/revision must be validated through the Commanding Officer and Public Affairs Officer of an installation.

**141 65 FLEET RECONNAISSANCE PHOTOGRAPHIC LABORATORY (SF)****FAC: 1441****BFR Required: Y**

14165-1 **DEFINITION.** These facilities are no longer programmed and are for inventory purposes only. All new Visual Information (VI) facilities should be captured under either CCN 14142 Air Intelligence Support Center or CCN 14160 Visual Information (VI) Facility.

**141 70 CONTROL TOWER (SF)****FAC: 1413****BFR Required: Y****Planning Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design**Design Criteria:** UFC 4-133-01, Air Traffic Control and Air Operations Facilities

14170-1 **DEFINITION.** A control tower provides space for equipment and personnel to control aircraft traffic. It is an elevated structure having an unobstructed line-of sight to the airfield approach areas, runways, taxiways, aircraft parking areas, and all other operational areas over which aircraft movements must be controlled. This category code is used for the control tower in all cases even though the tower may be an independent structure or combined with a RATCC or an aircraft operations building. If at all possible, the control tower should be an integral unit with the RATCC (Category Code 133 71, thus providing a complete, integrated air traffic control facility. A control tower is planned for each installation where aircraft are based. It is not planned for outlying fields and auxiliary landing fields unless specifically authorized by competent authority. The minimum installation is the basic tower containing an entrance level, intermediate levels, and the control tower cab. The area of floor space for a control tower of standard design with six floors plus the control room is 2,956 square feet gross. Towers of increased height can be provided by adding incremental levels.

**141 81 GROUND CONTROL APPROACH CREW FACILITY (SF)****FAC: 1412****BFR Required: Y**

14181-1 **DEFINITION.** The ground control approach (GCA) crew facility provides a ready room for on duty personnel assigned to the GCA van. The facility consists of two (2) standard design skid-mounted shelters (each 12 feet by 20 feet). The crew facility is authorized whenever the mobile GCA unit is furnished.

NOTE: Criteria for this facility indicates that it is to be portable and therefore carried as collateral equipment, when acquired. Collateral equipment is not Class II real property and cannot be included in the real property inventory. However, this category code is being retained for real property inventory purposes since many of the existing facilities are not portable and accordingly must be reported in the RPI.

**141V 82 FULL PRESSURE SUIT FACILITY (SF)****FAC: 1412****BFR Required: Y**

14182-1 **DEFINITION.** Pressure suit maintenance is normally performed in the Aviation Life Support Systems Shop (Non-Navair Depot), Category Code 211 75. Special justification is required to provide a separate facility for this purpose.

**141 87 LIQUID OXYGEN/NITROGEN FACILITY (SF)****FAC: 4122****BFR Required: Y**

14187-1 **DEFINITION.** A liquid oxygen/nitrogen facility is required at each Navy and Marine Corps air station where 50 or more attack and fighter-type aircraft are assigned. Smaller numbers of aircraft are provided with these gases by bottled gas from commercial suppliers. The facility provides for storage, vaporization, and transfer of non-industrial oxygen and nitrogen and for test and repair of cryogenic equipment associated with aviator and aircraft support. Liquid and gaseous forms of both oxygen and nitrogen, as well as hot nitrogen gas for purging equipment, are handled. The facility includes liquid storage tanks, vaporizing units, transfer areas, cart and tank filling and storage areas, repair shops, and office space. Port land cement concrete driveways, loading ramps, and cart parking areas are required. A building with a gross area of 2,704 SF is adequate for all needs. The facility has a storage capacity of 4,000 gallons each of bulk liquid oxygen and nitrogen and 150 cylinders of each gas. The size of the transfer areas may be reduced if a station survey indicates a lesser requirement for cylinder storage.

14187-3 MARINE CORPS CRYOGENICS FACILITY. A Marine Corps cryogenics facility provides for operational support of a Marine Aircraft Group and accommodates in garrison the expeditionary liquid oxygen/nitrogen generating equipment assigned. A Marine Corps cryogenics facility does not supplant the liquid oxygen/nitrogen facility at a Marine Corps air station. Generally, two generators are assigned to each Group. The exceedingly high noise level of the turbine-powered expeditionary liquid oxygen/nitrogen generator necessitates locating the facility in a remote area. The facility consists of a generator area, a cylinder fill area, cylinder and cart storage shelter, and main building. The generator area has a concrete pad, an underground fuel tank, exterior lighting, electric power, water, and an out building with a gross area of 246 square feet. Five hundred and ten square yards of concrete and 5,000 gallons of fuel storage are provided for a single generator. One thousand feet from the nearest generator is a shelter of 1,258 square feet gross area where gas cylinders are filled and converters and liquid oxygen and liquid nitrogen carts and cylinders are stored.

14187-4 The main building of the Marine Corps cryogenics facility has a gross area of 3,570 square feet and is located no closer than 100 feet from the shelter. The main building contains offices, toilets, classroom, maintenance shop, and repair parts storage. Because of the training mission conducted at this facility, normally only one generator is in production at a time. Hence, the storage shelter and the main building usually may be shared by all Groups utilizing this facility. The size of either the storage shelter or the main building may be modified if a survey indicates a different requirement.

**141 88 HARDENED AIRCRAFT SHELTER (SF)**  
**FAC: 1465**  
**BFR Required: Y**

14188-1 No criteria is currently available for this Category Code.

## **142 OPERATIONAL – HELIUM PLANTS**

**142 10 HELIUM PROCESSING PLANT BUILDING (SF)**  
**FAC: 1421**  
**BFR Required: Y**

14210-1 No criteria is currently available for this Category Code.

**142 19 HELIUM STORAGE BUILDING (SF)**  
**FAC: 1421**  
**BFR Required: Y**

14219-1 No criteria is currently available for this Category Code.

**142 20 HELIUM STORAGE FACILITY (EA)**  
**FAC: 1422**  
**BFR Required: Y**

14220-1 No criteria is currently available for this Category Code.

## **143 SHIP AND OTHER OPERATIONAL-BUILDINGS**

**143 08 EXPEDITIONARY OPS BOAT MAINTENANCE REPAIR FACILITY (SF)**  
**FAC: 2133**  
**BFR Required: Y**

14308-1 **DEFINITION.** An Expeditionary Operations Boat Maintenance Facility provides spaces for expeditionary units to perform continuous maintenance on boats. The facility will provide maintenance bays, a tool room, parts room, oily water separator system, overhead crane, and administrative support space.

14308-2 **REQUIREMENT CALCULATIONS.** Criteria is currently being developed for this category code. In the interim, please contact NAVFAC Atlantic AM2 for space allowance information.



**143 09 EXPEDITIONARY OPS SUPPORT FACILITY (SF)****FAC: 1444****BFR Required: Y**

14309-1 **DEFINITION.** An Expeditionary Operations Support Module (EOSM) provides the organic components of an expeditionary command and guidelines for associated CCNs to be used to support them. The EOSM would define the following attributes: Expeditionary Administration, (at a 80% of standard space allowance), Medical (A Contingency Aid Station provides medical care at the local level for the Expeditionary commands), Sensitive Compartmented Information Facility (SCIF), Mission Planning Cell (may or may not be part of SCIF), Training Classrooms (not NETC associated training), Armory (at a reduced footprint from the CCN 143-45), and Locker and Shower spaces to support the physical training requirement of an Expeditionary Combat Command.

14309-2 **ALLOWANCE.** Space allowances are being developed. Questions regarding criteria can be directed to the NAVFAC Atlantic Expeditionary Operations criteria manager.

**143 10 EMERGENCY VEHICLE GARAGE (SF)****FAC: 5307****BFR Required: Y**

14310-1 **DEFINITION.** This is a building for official emergency and alert vehicles, such as an ambulance. It is justified in instances when immediate response required by special waterfront operational vehicle. The building protects these vehicles from extreme weather to improve operational availability. The building is not used for vehicle services nor housing personnel. This category code excludes shelters used for aircraft and community fire and rescue vehicles, see Category Codes 141 20, 141 25, and 730 10.

The size of the garage is determined by the vehicle area plus nominal clearances surrounding the vehicle.

- A. Typically, three feet of clearance on each side is sufficient plus a gross to net factor of 1.05.
- B. In cases where vehicle side doors or access panels' clearances are greater than three feet, larger clearances may be justified.
- C. The distance between two vehicles should be the same as the side vehicle clearance.
- D. The front-end clearance should be no more than one foot.
- E. The rear clearance would vary the same as side clearances and depend on loading and accessibility. Three feet should be sufficient in most cases.
- F. A carport type shelter may be provided where the air conditioning design temperature on a 10% basis exceeds 87°F dry bulb.

- G. A garage may be provided where the heating design temperature on a 97.5% basis is less than 11°F dry bulb.

### **143 11 OPERATIONAL VEHICLE GARAGE (SF)**

**FAC: 1444**

**BFR Required: Y**

14311-1 **DEFINITION.** An operational vehicle garage is used for the storage of vehicles which are not utilized on a daily basis and which are exposed to adverse weather conditions that would have a detrimental effect upon them if stored out in the open. Accordingly, the type of vehicle stored, frequency of use and climatic conditions, will determine whether this type of facility is warranted.

14311-2 **INCLUSIONS/EXCLUSIONS.** This category code excludes 216 45 Line Vehicle Parking for airfield equipment, 214 40 Holding Shed for Public Works Transportation vehicles awaiting maintenance, 218 65 Equipment Holding Shed for Public Works Transportation construction vehicles and equipment, and 219 20 Pavement and Grounds Equipment Shed. This category code also excludes vehicles and equipment maintained and operated by the Public Works Transportation Department. This category code includes operational vehicles maintained by Naval Special Warfare Groups, Naval Construction Battalions, and other groups that are responsible for the maintenance and upkeep of their company vehicles. Some of the vehicles that may require environmental protection include MK V boats and Ridged Hulled Inflatable Boats (RHIBs). These types of boats have rubber hulls that can deteriorate more quickly when exposed to sun and extreme temperatures creating a significant increase in maintenance expense of these vehicles. A Construction Battalion may have all sorts of heavy construction equipment like pavers and backhoes, etc.

14311-3 **REQUIREMENT CALCULATIONS.** To calculate the total gross are for this facility, first tally the quantity for each type of vehicle. Assign a "type code" per the Type Code and NSF Table 14311-1, based on the length of the item. Next, develop the Civil Engineering Support Equipment (CESE)/Service Craft & Boat Support System (SABAR) NSF requirements in accordance with Tables 14311-1 and 14311-2, to determine the total NSF required to store the command's equipment. Add 250 SF for a Mechanical Room for the fire suppressant system. Sum the total NSF and the 250 SF (mech. room) to determine the total NSF that is required. Based on the Net to Gross (NTG) Table 14311-3, multiply the total NSF times the correct NTG factor to determine the Gross Square Feet (GSF). For the final GSF, round up to nearest whole number. A ratio of between 1.5 and 3 (length to width) of the overall facility is desired, if possible. If an existing facility is converted to this use, an increase of fifteen percent may be added to the total area in order compensate for incompatible column spacing, wall, etc.

**Table 14311-1: Type Code and NSF Table**

Size	Gen Description	Type Code	NSF
0 - 5 FT	Non-mechanized CESE and SABAR (ex: Generators, Air Conditioner/Heating Units)	1A	108
5 - 10 FT	Non-mechanized CESE and SABAR (ex: Fuel Water SIXCON, Motors, Pumps, Generators, TRICONS)	A	168
10 - 15 FT	Vehicles and non-mechanized CESE and SABAR (ex: Trailers, Fork Lifts, Small Zodiac Boats)	1B	228
15 - 20 FT	Vehicles and non-mechanized CESE and SABAR (ex: Passenger Vehicles, HMMWV, Light Plant, Fork Lifts, Small Zodiac Boats)	B	288
20 - 30 FT	Large CESE and SABAR (ex: MTRV, Fuel Trucks, Boats < 30FT)	C	408
30 - 40 FT	Extra Large CESE and SABAR (ex: Boats > 30FT, MTRVs, Scrapers, Water Well, Semi Trailers)	D	528
40 - 50 FT	Extra Large CESE and SABAR (ex: Boats > 40FT, Crane, Scrapers, Water Well, Semi Trailers)	E	648
50 - 60 FT	Extra Large CESE and SABAR (ex: Boats > 50FT, Semi Trailers, lowboy 55T)	F	768
60 - 70 FT	Extra Large CESE and SABAR (ex: Prime Mover and Boats > 60FT (11M w/ Prime Mover))	G	888

NSF: storage lanes are 12' wide (which includes side to side clearance for Inspection X length of component plus 2' front/back. The addition of the side to side and front/back is to provide space for minor Preventive Maintenance.

**Example Table 14311-2:  
CESE/SABAR NSF Calculation Table**

Description	Type Code	Total Qty	NSF/Item	Total NSF
Assembly:10178-AIR CONDITIONER / HEATING UNIT (IECU)	1A	3	108	324
Assembly:04250; SHORT DESC: COMPRESSOR,RECIPROCATING	1A	5	108	540
Assembly: 52680; SHORT DESC: MK18 56KW GENERATOR	A	8	168	1344
Assembly:088002; SHORT DESC: TRLR 400G TANK POTABLE WATER	1B	3	228	684
Assembly:06700; SHORT DESC: JLTV HEAVY GUN CARRIER W/ OPTION KITS	B	12	288	3456
Assembly:036091; SHORT DESC: HMMWV M1151A1B1 A-KIT	B	12	288	3456

Description	Type Code	Total Qty	NSF/Item	Total NSF
Assembly:036371; SHORT DESC: LSSV MAINT UTILITY CREW CAB W/ A-KIT	C	5	408	2040
Assembly: 70005; SHORT DESC: MEDIUM SERVICE SUPPORT VEHICLE (MSSV)	C	3	408	1224
Assembly:058867; SHORT DESC: TRK CARG 7T MIL	D	3	528	1584
Assembly:082655; SHORT DESC: TRLR 55T SEMI LOWBED DED HYDRAULIC REMOVABLE GOOSE	E	3	648	1944
		57		16,596

**Table 14311-3:  
Net to Gross Table**

FROM	TO	NTG
0 SF	20,000 SF	1.35
20,000 SF	50,000 SF	1.2
50,000 SF	150,000 SF	1.15
150,000 SF	above	1.1

NTG: includes 2' perimeter lane along all walls and a 20' access lane.

	Total SF	16,596 SF
Add 250 SF for Mechanical Room (Fire sprinkler system)		250 SF
	NTG:	1.35
	Total:	22,742.10 GSF
	Say:	22,743 GSF

**143 12 OPERATIONAL VEHICLE LAYDOWN AREA (SY)**

**FAC: 8523**

**BFR Required: Y**

14312-1 **GENERAL.** Many Navy and Marine Corps operational commands have missions that require the acquisition, operation, and maintenance of various types of vehicles and equipment. Examples of these include Civil Engineering Support Equipment (CESE) and Service craft and Boat Accounting Report (SABAR) equipment. These items are typically acquired based on information shown in each command's Tables of Allowance and Equipment (TOA & E; Navy) or Table of Equipment (TE; Marine Corps) and are usually associated with an operational maintenance shop or motor pool. As a result, these commands have requirements for secure paved areas for

storing these vehicles and equipment. These areas are typically different from standard parking areas in that they require more robust parking surfaces and they are sized to accommodate vehicles and equipment that are infrequently used. This CCN is intended for long term storage of specialized vehicles and equipment only, and normal command staff parking should continue to be captured under CCN 85210 or similar.

**14312-2 DEFINITION.** An operational vehicle parking and/or laydown area consists of an asphalt or concrete paved area large enough to store and provide circulation for the vehicles and equipment for which the command is responsible. Vehicles can range from a typical passenger vehicle to a large prime mover such as an MTRV truck. The equipment requiring storage can range from towable generator sets or light packs to large flatbed trailers. It also includes operational small craft such as the in-shore fast boats and their trailers. These parking/laydown areas require perimeter fencing and in some case will require site lighting adequate enough to perform vehicle or small craft outfitting or minor repairs during night time hours. This category code should also be used to capture parking and maneuvering areas associated with CCN 15522 Small Craft Boat Ramp facilities (where the parking/laydown requirements are captured as a CCN14312 utilization on the associated boat ramp property record card).

**14312-3 ALLOWANCE.** Space allowances are based on engineering evaluations that summarize the size and quantity of each vehicle shown on the requesting command’s TOA. The process for determining overall requirements is as follows:

1. Using the “General Description” column in Table 14312-1 (see below), planners must determine the type code for each vehicle/equipment type being used by the command. In cases where the general description is unclear or doesn’t match that which is listed, use the actual item length and compare it to the “Size” column in the table to determine the type code.

**Table 14312-1 Engineered Surface Laydown**

Size	General Description	Type Code	GSY	GSF	*Net to Gross Factor
Small (<10FT)	Non-mechanized CESE and SABAR (ex: Fuel Water SIXCON, Motors, Pumps, Generators, TRICONS)	A	19	168	1.50
Medium (10FT-20FT)	Vehicles and non-mechanized CESE and SABAR (ex: Passenger Vehicles, HMMWV, Light Plant, Fork Lifts, Small Zodiac Boats)	B	32	288	1.75
Large (20FT-30FT)	Large CESE and SABAR (ex: MTRV, Fuel Trucks, Boats < 30FT)	C	46	408	1.75
Extra Large (30FT-40FT)	Extra Large CESE and SABAR (ex: Boats > 30FT, Scrapers, Water Well, Semi Trailers)	D	59	528	2.00
Extra Large (40FT-50FT)	Extra Large CESE and SABAR (ex: Boats > 40FT, Scrapers, Water Well, Semi Trailers)	E	72	648	2.00

Size	General Description	Type Code	GSY	GSF	*Net to Gross Factor
Extra Large (50FT-60FT)	Extra Large CESE and SABAR (ex: Boats > 50 FT, Semi Trailers, lowboy 55T)	F	86	768	2.25
Extra Large (60FT-70FT)	Extra Large CESE and SABAR (ex: 11M Rib with Prime Mover; 40PB with Prime Mover)	G	99	888	2.25

\* Net to gross factor includes drive lanes/maneuvering areas, and circulation space around each item.

- When requirement is for covered laydown engineered surface, use the Covered Laydown (Table 14312-2). The area is determined by: Component length (based on table's Type Code) x NUMBER OF CESE for each item.

**Table 14312-2 Covered Laydown**

Type Code	Length (FT)
1A	5
A	10
1B	15
B	20
C	30
D	40
E	50
F	60

- Once the type codes are assigned for each item in the command's TO&A/TE, multiply the area allowances per each type (A through G) by the quantity of each type needed. The sum of the total areas for each type code is then the total area requirement for the parking/laydown area for the command's operational vehicles and equipment. This area includes circulation and maneuvering space.

NOTE: For parking/laydown areas associated with CCN 15522 Operational Boat Ramp facilities only: Determine the required area based on the average number of boat trailers, prime movers, and support vehicles/equipment to be parked on site during a typical training mission and use Table 14312-1 to determine a total gross area (same process as shown above). Add an additional 5% to this gross area to account for the prime mover/trailer combination maneuvering apron located adjacent to the boat ramp.

**143 13 OPERATIONAL VEHICLE/EQUIPMENT CANOPY (SF)**

**FAC: 1459**

**BFR Required: Y**

14313-1 **DEFINITION.** An operational vehicle/equipment canopy is used by the Navy and Marine Corps expeditionary units to protect vehicles and equipment from the weather. These canopies are usually associated with operational vehicle laydown areas or similar.

14313-2 **ALLOWANCE.** Sizing of these canopies is accomplished via an engineering analysis and is based upon the total area occupied by vehicles and/or equipment plus any related circulation between them. Note that canopies are measured by the drip line projected from the roof eaves down to ground level.

### 143 15 RANGE OPERATIONS CENTER (SF)

**FAC: 1731**

**BFR Required: Y**

14315-1 **DEFINITION.** A range operations center is the control point for testing torpedoes, calibrating ships' firing systems, and training pilots and testing aircraft on gunnery and bombing ranges. The center will vary with the equipment and control areas required. Standard planning factors for a center are not available. Its size must be planned to support the equipment and control areas to be housed.

### 143 17 SPACE SURVEILLANCE FACILITY (SF)

**FAC: 1444**

**BFR Required: Y**

14317-1 **DEFINITION.** Requirements are determined by Naval Network and Space Operations Command. Facilities typically support global space surveillance network which detects, tracks, identifies, and catalogs man-made objects in space and provides position information on these objects.

### 143 20 ORDNANCE OPERATIONS BUILDING (SF)

**FAC: 1444**

**BFR Required: Y**

14320-1 **DEFINITION.** An ordnance operations building is authorized where there is a need to control an ordnance operation. Ordnance operations are those involving ammunition storage, handling or disposal and organizational level maintenance. The facilities whose primary function is ordnance maintenance, intermediate level and above, are addressed in the 200 series Category Codes.

14320-1.1 **Installation Ordnance Operations Building.** At an ammunition storage or handling installation the authorized building space are 150 gross SF per person for administrative personnel and 50 gross SF per person for operating personnel (ammunition handlers, etc.). This provides space for an office (s), assembly and briefing room for ammunition handlers, locker room, and storage space for ammunition handling tools and equipment. Space requirements may increase as handling and support equipment changes dictate larger work and storage areas. Sufficient justification should support the increased space requirements. Air installations with bomb build-up requirements can plan for a weapons build-up facility. This facility serves as an ordnance assembly area for bombs, missiles and the like prior to going to the flight line for loading on aircraft. An overhead hoist, work tables

and several roll up doors are minimal requirements to promote the build up process. This facility can also serve to perform basic ordnance maintenance. Planning criteria is not available because of the potential multi-functions that may be served in this facility. Recommend a space analysis starting with a process flow and identifying functions to be performed.

14320-1.2 **Explosive Ordnance Disposal Facilities.** The EOD facilities have been moved to Category Codes 143 22, 143 23 and 143 24.

### **143 21 AMMUNITION SEGREGATION FACILITY (SF)**

**FAC: 1443**

**BFR Required: Y**

14321-1 **DEFINITION.** A segregation facility is a building or series of buildings where fleet return explosive and inert material are screened and grouped by type and physical condition.

14321-1.1 Definition from NAVSEA OP-5 Vol. 1: Typically these functions are located at Naval Weapons Station or Naval Magazine installations. For these larger installations, there may be multiple segregation facilities for bomb-type ammunition, general ammunition and propellant powder buildings. At smaller ammunition installations there would be just one segregation facility. For additional information see the NAVSEA OP-5 Manual.

14321-1.2 No planning criteria exist for the segregation function; recommend an engineering evaluation be completed. Functional examples might be: Shipping /receiving, inspection area, banding area and a technical documents area, etc. Some questions that might be asked of the facility user interviews: What is approx. ordnance throughput (amount/time period) average? Peak? What types of ordnance? Containerized precision guided munitions may require large amounts of space versus palletized ordnance. Will explosives be left in facility overnight? NAVSEA OP-5 safety criteria will dictate requirements.

### **143 22 NAVY EXPLOSIVE ORDNANCE DISPOSAL SHORE DETACHMENT FACILITY (SF)**

**FAC: 1444**

**BFR Required: Y**

14322-1 **DEFINITION.** the nature and scale of the EOD operations involved, billets will be assigned for a "shore detachment" (1 officer, 1 – Leading Chief Petty Officer (LCPO), and 7 enlisted personnel). The facilities defined below are sized to support an EOD Shore Detachment (DET) and includes the following: Operational Space – built to "Open Secret", armory – built to meet **OPNAVINST 5530.13C, Physical Security Instruction for Conventional Arms, Ammunition, and Explosives, Armory**, latest revision. Lobby/Quarter Deck, Operational Space, Locker/Shower room, and drying cages (climate controlled) will be in environmentally controlled spaces. Open Bay



spaces will include: 1) Workshop/Maintenance spaces, equipment storage, 2) exterior fresh water wash down area with deep sink, 3) drying area, and 4) four-bay High Bay Area Vehicle/ Boat Storage/miscellaneous emergency response equipment area. High Bay area must be provided with exhaust ventilation system and 16' x 16' roll-up doors. One bay, minimum, will be a "drive-through" to support the Multi-Mission Expeditionary Response Truck (MERT) and the trailer. To ensure correct line-up into the MERT bay, provide a straight approach lane, 58 feet x 16 feet, in front of and behind (for drive through lane) the facility for access.

Description	NSF	Climate Control	Net to Gross
Lobby/Quarter Deck			
Lobby and Sign In Area	165	Yes	1.35 to 1
Bunk Room	100	Yes	1.35 to 1
Male/Female Restroom for EOD Shore DET personnel	48	Yes	1.35 to 1
Provide a male/female restroom for lobby area	48	Yes	1.35 to 1
<b>CONSTRUCT TO OPEN SECRET</b>			
OPS (admin)	948	Yes	1.35 to 1
private offices - 2 ea: 200 SF, general office space – 7 ea: 448 SF Planning and Briefing Cell: 150 SF SIPER Room: 1 ea: 150 SF			
Male Restroom for EOD Shore DET personnel within the Open Secret Spaces	62	Yes	1.35 to 1
Female Restroom for EOD Shore DET personnel within the Open Secret Spaces	46	Yes	1.35 to 1
Shore DET PGI Cages			
9 ea @ 112 SF/cage	1,008	Yes	1.35 to 1
Shore DET Changing Room			
Male Bathroom/Shower/Locker Area	194.5	Yes	1.35 to 1
Female Bathroom/Shower/Locker Area	95	Yes	1.35 to 1
Drying Cages Area			
9 ea at 36 SF/cage (Drying Cages to be Climate & Humidity Controlled)	324	Yes	1.35 to 1
Armory			
(Armory must meet OPNAVINST 5530.13C, Physical Security Instruction for Conventional Arms, Ammunition, and Explosives, Armory requirements)			
General Armory Space for maintenance parts storage, safe, HazMat Locker, workbench, ect	433	Yes	1.35 to 1
Weapons and Case Storage	180	Yes	1.35 to 1

Description	NSF	Climate Control	Net to Gross
<b>Communications Gear Storage</b>			
Shelving (4 In ft x 2 ft deep and 4 In ft x 4 feet deep) for communications gear storage	65	Yes	1.35 to 1
<b>OPEN BAY AREA</b>			
<b>Operational Storage</b>			
Shore DET Operational Storage Cage Space (Section 10 material), 10' x 10'. Size based on 8' max stack height	100	No	1.35 to 1
TOA stored on shelving units - Section 47: 32 sf plus 2.25 clearance factor(BDY ARMR EOD/LG)	72	No	1.35 to 1
Open floor space for items too heavy to store on shelving	538	No	1.35 to 1
TOA Storage (items not in Cage, on shelves, or on floor), Total Cubic Foot	975	No	1.0 to 1
<b>Note:</b> Net to Gross built into the GSF calculation for TOA storage			
<b>Miscellaneous Work Areas</b>			
Maintenance Work Benches, 2 ea	108	No	1.15 to 1
Wet Charging Stations, 2 ea - 2' x 6'	54	No	1.15 to 1
2 ea dip tanks located near exterior wall to be connected to Shore DET Air Compressor located near exterior wall under cover)			
<b>Shore DET Open Area for Misc functions</b>			
12 sf/EOD Tech	96	No	1.15 to 1
<b>CESE/SABAR Storage</b>			
Four Bays; Bays to be 68' deep X 16' wide with a 16' x 16' bay opening	4,352	No	1.15 to 1
<b>Note:</b> Provide at least One bay with drive through capability			
<b>EXTERIOR SPACES/FUNCTIONS</b>			
<b>Exterior Rinsing Station</b>			
Outside showers and wash sink is required. Provide 4 Showers, 1 stainless steel sink, 8' W x 4' deep and appropriate screening for outdoor gear washing.	108	No	1.10 to 1
Equipment Wash Tank, 2 ea, 6' L x 2' W	27	No	1.10 to 1
Temp exterior drying cage area (equipment/material staging/drying racks/shelving), 6 each, 3' x 4', cage spaces	162	No	1.10 to 1

Description	NSF	Climate Control	Net to Gross
Covered area outside of DET facility High Bay area for the DET's air compressor. Area to include cover from weather and piping, certifiable to Breathing Air standards and routed into the DET's Wet Charging station inside the High Bay space.	25	No	1.10 to 1

14322-2 In addition to the EOD shore detachment building proper, there are supporting facilities, which are located separately to meet safety requirements. This square footage is not part of this CCN and, therefore a separate BFR must be submitted for this requirement. The EOD Shore DET will require either a Golan or Ready Service Locker, both equipment, to house small quantities of explosives. This equipment must be mounted on an Explosive Storage Site Pad, CCN 425-11, and the Explosive Storage Site Pad will be sited In Accordance With Naval Ordnance Safety and Security Activity (NOSSA) Instruction 8020.22 (latest revision). The Shore DET will need an Ordnance Demolition Area for destroying explosives and explosives-loaded devices, see CCN 148-20. Include an Observation Tower/Bunker for the protection of the EOD Shore DET personnel, CCN 173-40, to support the Ordnance Demolition Area. The Shore DET will need space for a generator to support Intrusion Detection System (IDS) requirements for AA&E/Classified Storage. Provide a Miscellaneous Open Storage Pad, CCN 852-40. Size the pad in accordance with the size of the backup generator plus a clearance area of 3 foot minimum on all sides of the generator to accommodate facility maintenance. The generator is equipment, and therefore must be provided by the command. In situations where the Shore DET requires a boat ramp and pier space, add CCNs 143-12, 155-20 and 155-22.

14322-3 **EOD Shore Detachment Facility:**

EOD Shore DET Building	CCN 143-22: 12,032 GSF
Additional Requirements:	
Operational Vehicle Parking/ Laydown Area	CCN 143-12: 338 GSY
Explosive Storage Site Pad	CCN 425-11: Sized to requirement
Ordnance Demolition Area	CCN 148-20: Sized to requirement
Observation Tower/Bunker	CCN 173-40: Sized to requirement
Backup Generator	CCN 852-40: Sized to requirement
Boat Ramp	CCN 155-22: 1 ea
Small Craft Berthing	CCN 155-20: 89 FB, 2,250 SF
POV Parking	CCN 852-10: Sized for 9 personnel plus 2 visitor parking spaces

**143 23 NAVY EXPLOSIVE ORDNANCE DISPOSAL MOBILE UNIT (EODMU)  
FACILITY (SF)**

**FAC: 1444**

**BFR Required: Y**

14323-1 **DEFINITION.** EODMUs are responsible for manning, equipping and training of any number of deployable EOD detachments: Mobile Detachments, Area Search Detachments, Ordnance Clearance Detachments, Mobile Communications Detachments, Combat Service Support Detachments, Fly Away Recompression Chamber Detachments, Mine Counter Measures Detachments and Marine Mammal System Detachments. Facilities are required for administrative activities, equipment maintenance and storage, training and operations. Manning levels vary by MU, so square foot requirements for a given installation is based on the following criteria, all SF are net (NSF):

14323-1.1 **Net to gross markups by functions:**

- Administration through bath/showers functions below: 1.25
- Training Spaces: 1.33
- Supply/Storage: 2.38
- Remainder, operational spaces: 1.33

14323-1.2 **Administrative spaces:** 120 SF per administrative worker (includes CO, XO, CMC, MAA and all administrative department personnel).

14323-1.3 **Classified equipment and documents area:** 300 SF plus an additional 25 SF for each detachment assigned for the storage and maintenance of classified documents and equipment.

14323-1.4 **Quarterdeck:** Allow 150 SF for security screening area.

14323-1.5 **Bunkroom:** Allow 72 SF for each member of the watch. Separate male and female bunkrooms required.

14323-1.6 **Bathrooms/Showers:** Allow 15 SF/water closet, 20 SF/shower, 6 SF/urinal and 6 SF/lavatory with the number of fixtures appropriate for the maximum number of personnel using the facility at one time.

14323-1.7 **Multi-purpose Training/Conference Room:** Use Category Code 171-10, General academic. Loading is based upon an all-hands function, the mobile unit and all assigned detachments.

14323-1.8 **Academic Instruction Space:** Use Cat Code 171-10, General academic. Allow for instructor(s) space.

14323-1.9       **Supply/Storage:** Allow 2,100 SF for spare parts storage and 450 SF of administrative area for supply functions. The administration area should use the admin. net to gross markup above.

14323-1.10      **Magnetometer Room:** Allow 360 SF for testing of special purpose low magnetic signature tools.

14323-1.11      **Compressor Room:** Allow 300 SF for divers fixed high-pressure compressor and flasks.

14323-1.12      **Hydro Room:** Allow 300 SF for hydro test equipment.

14323-1.13      **MK 16 Locker:** Allow 800 SF for maintenance and preparation of MK 16 diving equipment. This needs to be an O<sub>2</sub> clean room.

14323-1.14      **Communal Staging Area.** Allow 1,000 SF for a communal outdoor staging area for assigned mobile detachments. Used prior to deployment for gear inspection and preventive maintenance.

14323-1.15      **Electronics Shop.** Allow 400 SF for maintenance of communications and navigation equipment.

14323-1.16      **Personnel Lockers.** Allow 12 SF for each diver and 6 SF for each additional support person assigned.

14323-1.17      **Medical Area.** Allow 150 SF for a doctor or independent duty corpsman (if both, 150 each), 200 SF for an examining room and 150 SF for a waiting area/medical records office.

14323-1.18      **Scuba Locker:** Allow 1350 SF for maintenance and preparation of scuba diving equipment.

14323-2       **Spaces.** The unique detachment missions may dictate additional spaces. The different type of EOD detachments and their space requirements that may be assigned to the Mobile Units are listed below. The typical manning levels are provided; should additional space be required, it must be individually justified.

14323-3       **Area Search Detachment (ASD):** Allow 450 SF for equipment storage and maintenance and 150 SF of administrative area for each ASD assigned. Manning: 1 Off/ 7 Enl.

14323-4       **Combat Service Support Detachment (CSSD):** Allow 1,200 SF for administrative, 6,000 SF warehouse for material and equipment storage and 3,968 SY controlled outside equipment lay down storage. Manning: 1 Off/ 16 Enl.

14323-5       **Fly Away Recompression Chamber Detachment (FARC):** Allow 1,204 SF for administrative, supply and equipment storage and 90 SY lay down compound for (1) FARC, (1) Generator set and (1) 8' x 8' x 10' Milvan. Manning: 1 Off/ 5 Enl.

14323-6 **Marine Mammal System Detachment (MMS):** Allow 1000 SF for each Mark shop assigned (e.g. Mk 5). Allow 432 SF for veterinarian. Allow 800 SF for food preparation. The Marine Mammal Systems Managers will determine space requirements for holding pens, staging areas and Marine Mammal Management Facilities. These spaces are regulated by Federal regulations and standards. Manning: 1 Off/ 15 Enl.

14323-7 **Mine Counter Measures Detachment (MCM):** Allow 1700 SF for equipment storage and maintenance and 150 SF for administrative area for each MCM detachment assigned. Manning 1 Off / 7 Enl.

14323-8 **Mobile Communications Detachments (MCD):** Allow 1,850 SF for equipment storage and maintenance and 150 SF of administrative area for each MCD assigned. Manning: 1 Off/ 7 Enl.

14323-9 **Mobile Detachments (MOB):** Allow 800 SF for equipment storage and maintenance and 150 SF for administrative area each mobile detachment assigned. Manning: 1 Off/ 7 Enl.

14323-10 **Ordnance Clearance Detachments (OCD):** Allow 480 SF for equipment storage and maintenance. Allow 150 SF of administrative area for each OCD's assigned to the mobile unit. Manning: 1 Off/ 7 Enl.

14323-11 **Additional Functions.** Additional functions associated with EOD units/detachments are mission driven and must be individually justified. The following Category Codes are some applicable selections:

- Parachute Survival Equipment Shop: use Category Code 211 75.
- Small Craft Fuel Station: use Category Code 122 20.
- Small Craft Fuel Storage Area: use Category Code 122 30.
- Emergency Vehicle Garage: use Category Code 143 10.
- Operational Vehicle Garage: use Category Code 143 11.
- Operational Storage: use Category Code 143 77.
- Armory: use Category Code 143 45.
- Hazardous Material/Flammable Storage: use Category Code 143 78.
- Ordnance Demolition Area: use Category 148 20.
- Small Craft Berthing: use Category Code 155 20.
- Landing Craft (boat) Ramp: allow one EA under Category Code 159 66.
- Light Demolition Range: use Category 178 30.
- Boat Shop: use Category Code 213 58.
- Vehicle Holding Shed: use Category Code 214 40.
- Vehicle Shop: use Category Code 214 20.
- Ready Magazine: use Category Code 421 35.
- Open Storage Area: use Category Code 451 10.
- Parking Area: use Category Code 852 10.

**143 24 MARINE CORPS EXPLOSIVE ORDNANCE DISPOSAL FACILITY (SF)**  
**FAC: 1444**  
**BFR Required: Y**

14324-1 **DEFINITION.** These facilities provide support for Marine Corps EOD shore teams and platoons permanently assigned to Marine Corps installations. The manning structure for EOD teams and platoons has increased and is reflected below in category codes 143 24 and 143 26.

14324-2 This facility provides support for EOD operations on Marine Corps Bases, Marine Corps Air Stations, and Marine Corps Air Wing Support Squadrons. The facility defined below is scaled to match the EOD Team (1 Officer, 8 Enlisted) and include administrative spaces, classified publication vault, quick response ready lockers, workshop/maintenance space, classroom, equipment storage, locker room, and ordnance training aids library space. The facility will be equipped with an Intrusion Detection System (IDS). In addition, the facility will house all the emergency response vehicles, trailers (including total containment vessels), and other emergency response equipment.

14324-3 In addition to the EOD team facility proper, there are supporting facilities, which are located separately to meet safety requirements. The hazardous/flammable storage building, category code 143 78, stores petroleum products, petroleum operated equipment, corrosives, and paints. Typically these building are 12'x17', but larger sizes may be justified depending on the team's operational mission. This building should be located as close the EOD building as safety standards permit. The other facilities are the ready service magazines and are described under category code 421 35 as "Ready Magazines". Refer to category code 421 series to understand the unique storage requirements of ordnance. These are sited in accordance with safety criteria published in NAVSEA OP 5, Volume 1, "Ammunition and Explosives Ashore" (abbrev. Title).

14324-4 When multiple EOD teams are assigned to the same installation and when collocating teams is viable, the gross square below should be multiplied by the number of teams assigned. Overall square footage may be reduced for common use spaces.

**Table 14324-1**  
**Overall Square Footage Requirements**  
**For EOD Teams**

EOD Building	7000 GSF
EOD Haz/Flam Building	204 GSF or sized to requirement
EOD Ready Service Magazine	Sized to requirement

14324-5 Submitted basic facility requirement (BFR)s shall include the EOD Table of Organization for the installation supported and facility component breakdowns of the overall requirement (i.e. admin, vehicle/trailer housing, storage, publication vault, locker area, etc).

**143 25 SEAL TEAM BUILDING (SF)****FAC: 1444****BFR Required: Y**

**Note:** This Category Code contains assets that were previously classified under 143 28.

14325-1 **DEFINITION.** The requirements for these facilities are developed by an industrial analysis for the specific facility. See category code 610 10 for administrative space guidelines and category code 159 64 for Waterfront Operations Building guidelines.

**143 26 MARINE CORPS EXPLOSIVE ORDNANCE DISPOSAL COMPANY FACILITY (SF)****FAC: 1444****BFR Required: Y**

14326-1 This facility is necessary for manning, equipping, and training for EOD operations in support of Fleet Marine Forces (FMF). The facility organization components below are scaled to match the EOD Company (10 Officers, 99 Enlisted), which incorporates 7 EOD Sections (1 Officer, 12 Enlisted), an Operations and Training Unit (1 Officer, 12 Enlisted), and a Headquarters (2 Officers, 3 Enlisted). Additionally, standalone FMF EOD sections can scale their requirements to the listed criteria. Facilities are required for administration, equipment maintenance and storage, training, and operations. All square footage criteria are in Net Square Feet (NSF). The Net-to-Gross conversion to calculate Gross Square Feet (GSF) is 1.4.

**14326-1.1 Headquarters and Operational and Training Unit**

**Administrative Space.** Allow 1,910 SF for administrative functions; this includes Company Commander, Company Executive Officer, EOD Chief, First Sergeant, Operations Officer, Operations Chief, and all other administrative department personnel.

14326-1.2 **Secure Waiting Area.** Allow 120 SF for security screening and visitor waiting area.

14326-1.3 **Conference Room.** Allow 240 SF for meetings with section operations and training and headquarters leadership. Conference room requires the capability to conduct classified discussions.

14326-1.4 **Classified Publications Vault.** Allow 811 SF for storage of classified material and administrative space. This space requires Intrusion Detection System (IDS) and all current physical security requirements outlined in Marine Corps Order (MCO) 5530.14A "Marine Corps Physical Security Program Manual."

14326-1.5 **Bathrooms/Showers.** Allow 15 SF/water closet, 20 SF/shower, 6 SF/urinal, and 6 SF/lavatory with the number of fixtures appropriate for the maximum



number of personnel using the facility at one time. Allow 200 SF for female bathroom/shower area.

14326-1.6 **Multi-Purpose Classroom.** Use Category Code 171 10, Section 17110-1.1 "General Academic Classroom for determining the space requirements. This type of classroom requires the capability to allow for classified briefings and EOD reporting discussions. The loading is based upon an all-hands function or the maximum of 100 students.

14326-1.7 **Communal Staging Area.** Allow 1,000 SF for a communal outdoor staging area for assigned detachments. This staging area is for use prior to deployment and supports gear inspections and preventative maintenance. Provide a paved area at a minimum.

14326-1.8 **Training Aids Library.** Allow 2,000 SF for this type of library, which is used to store/display inert training aids. Space allocation is for a standalone EOD section, company, or combined facility.

14326-1.9 **Break Area.** Allow 811 SF for a break area. Space allocation is for a standalone EOD section, company, or combined facility.

14326-1.10 **Material and Equipment Work Area.** Allow 2,400 SF for spare parts storage, expendable equipment, and unassigned company table of equipment.

14326-2 **Explosive Ordnance Disposal Section.** This section requires additional space for each EOD unit of action. Allocate 1,200 SF for administration area and 2,400 SF for material, equipment, and maintenance area for each EOD section. The manning level for each EOD section is 1 Officer and 12 Enlisted personnel.

14325-2.1 **Personnel Lockers.** Allow 18 SF per person for the maximum number of personnel using the facility at one time. The size of the facility is to accommodate all the necessary combat equipment that each EOD section member is assigned.

14326-3 **Exploitation Facility.** The exploitation facility must be associated directly with an "Ordnance Demolition Area" under Category Code 148 20 and/or "Light Demolition Range" under Category Code 178 30. The exploitation facility supports both training and operational taskings to satisfy mission requirements. Use the following category codes for reference:

- 143 21 Ammunition Segregation Facility
- 216 10 Ammunition Rework and Overhaul Shop

14326-4 **Marine Corps EOD Divers - EOD Dive Officers – Littoral Explosive Ordnance Neutralization (LEON) Capable EOD Sections.** The requirements are listed below:

14326-4.1 **Magnetometer Room:** Allow 360 SF for testing of special purpose low magnetic signature tools.

14326-4.2 **Compressor Room:** Allow 300 SF for divers fixed high-pressure compressor and flasks.

14326-4.3 **Hydo Room:** Allow 300 SF for hydro test equipment.

14326-4.4 **MK 16 Locker:** Allow 800 SF for maintenance and preparation of MK 16 diving equipment. An O<sub>2</sub> clean room is required to support maintenance and preparation.

14326-4.5 **Scuba Locker:** Allow 1,350 SF for maintenance and preparation of scuba diving equipment.

14326-4.6 **Fly Away Recompression Chamber (FARC):** Allow 1,204 SF for administrative, supply and equipment storage and 90 SY for laydown compound to support 1 FARC, 1 generator set, and 1 (8' x 8' x 10') Milvan.

14326-4.7 **Additional Equipment Storage and Maintenance:** Allow 1,700 SF for equipment storage and maintenance per LEON capable EOD section.

14326-5 **General BFR Guidelines.** Submitted Basic Facility Requirements (BFRs) will include the EOD Table of Organization and Equipment for the installation supported and facility component breakdowns of the overall requirement (i.e. admin, vehicle/trailer housing, storage, classified publication vault, locker area, etc.).

14326-6 **Additional Category Code Functions.** Additional functions associated with EOD company/sections are mission driven and must be individually justified. The following category codes illustrate these additional functions:

- Small Craft Fuel Station: use Category Code 122 20.
- Small Craft Fuel Storage Area: use Category Code 122 30.
- Emergency Vehicle Garage: use Category Code 143 10.
- Operational Vehicle Garage: use Category Code 143 11.
- Armory: use Category Code 143 45.
- Operational Storage: use Category Code 143 77.
- Hazardous Material/Flammable Storage: use Category Code 143 78.
- Ordnance Demolition Area: use Category 148 20.
- Small Craft Berthing: use Category Code 155 20.
- Landing Craft (boat) Ramp: allow one EA under Category Code 159 66.
- Light Demolition Range: use Category 178 30.
- Parachute Survival Equipment Shop: use Category Code 211 75.
- Boat Shop: use Category Code 213 58.

- Vehicle Shop: use Category Code 214 20.
- Vehicle Holding Shed: use Category Code 214 40.
- Ready Magazine: use Category Code 421 35.
- Open Storage Area: use Category Code 451 10.
- Parking Area: use Category Code 852 10.

**143 35 REGISTERED PUBLICATIONS ISSUING OFFICE (SF)**

**FAC: 1444**

**BFR Required: Y**

14335-1 **DEFINITION.** A Registered Publications Issuing Office (RPIO) has a primary mission of supporting communications operations of the Fleet, Naval Aviation, U.S. Marine Corps, and the U.S. Coast Guard. RPIO's receive, store, issue, account for, and-officiate during the destruction of highly classified cryptological publications, equipment, and devices circulating in the Registered Publications System (RPS). An RPIO has three major space areas: Storage, Receive/ Issue, and Administration. The storage area of the RPIO must be constructed to meet the criteria of a Class A vault as defined in KAG-1D. The size of an RPIO can generally be related to the number of RPS items handled yearly. RPS items are such things as publications, magnetic tapes, films, crypto equipment, spare parts, cards, and other key material. See Table 14335-1 for planning factors.

**Table 14335-1. Space Allowances  
Registered Publications Issuing Office**

<b>RPS Items Handled Per Year (Thousands)</b>	<b>Gross Area (SF) Admin, Receive/Issue, Vault</b>
100 - 500	7,500
501 - 750	12,500
751 - 1,250	14,000
1,251 - 2,500	16,000

**143 40 COMPUTER PROGRAMMING OPERATIONS CENTER (SF) [DELETE]**

**FAC: 6104**

**BFR Required: Y**

14340-1 This category is deleted. All future requirements should be reassigned and revised to Category Code 13115 "Communications, Information, or Intelligence Analysis Facility".

**143 41 AMPHIBIOUS OPERATIONS BUILDING (SF)**

**FAC: 1431**

**BFR Required: Y**

14341-1 The requirements for these facilities are developed by an industrial analysis for the specific facility. See category code 610 10 for administrative space guidelines and category code 159 64 for Waterfront Operations Building guidelines.

**143 45 ARMORY (SF)**

**FAC: 4427**

**BFR Required: Y**

14345-1 **DEFINITION.** A Navy installation armory provides space for storage and routing maintenance of small arms and emergency gear. The materials stored will provide for emergencies and for training of selected personnel in the handling of station emergencies, civil disorders, and area disasters. See Table 14345-1 for space allowance.

**Table 14345-1. Armory**

<b>Installation Military Strength</b>	<b>Building Gross Area</b>
up to 2,000	576
2,001 - 4,000	880
4,001 - 7,500	1,200
7,501 - 10,000	1,508
Over 10,000	Add 0.1 sq ft per person

14345-2 The space above provides for an armory and small arms shop supporting only the weapons and personnel assigned to that installation. See Category Code 215 10 for Small Arms Shop in support of multiple installations.

14345-3 An additional 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. Requirements are listed on the Marine Force Armory website. Go to the "input" worksheets for: terms, definitions, weapon storage dimensions and basic algorithms for different types of weapons and equipment. Use this information to calculate space requirements.

14345-4 Armory design specifications can be found in MIL-HDBK-1013/1A and additional policy and guidance in OPNAVINST 5530.13 Series, Fleet Marine Force Armory (SF).

14345-5 An armory for Fleet Marine Force air and ground units provides a humidity controlled, air conditioned and secure space for storing and maintaining weapons assigned to personnel. Consolidation of unit armories should be emphasized provided such action is compatible with mission requirements, responsiveness and accessibility.

14345-6 The SF allocation for the Marine Force armory can be determined by locating the P-80 on the NAVFAC portal. The criteria algorithm is an EXCEL spreadsheet with the instructions provided in the first worksheet. Once the spreadsheet is opened go to the “instructions” worksheet.

14345-7 If you intend on using the spreadsheet to calculate facility requirements, it is suggested you perform a “save as” function to operate the spreadsheet from your computer vice via the Internet.

Click [here](#) to go to the spreadsheet.

### **143 46 MARINE BARRACKS - GENERAL PURPOSE BUILDING (SF)**

**FAC: 1446**

**BFR Required: Y**

14346-1 **DEFINITION.** The criteria contained herein are applicable to CNO commanded Marine Barracks. The purpose of the Marine Barracks is to provide such security as approved by the Chief of Naval Operations, in coordination with the Commandant of the Marine Corps, and to perform such additional functions as directed by CMC.

14346-2 The criteria for Marine Barracks cover general-purpose functions only (for example, administration/operational, general instruction, armory and supply). Requirements for specific functions such as shop space, specialized storage, etc., should be developed from criteria of the Category Code for the specific function. This criterion does not include BEQ or community support facility requirements. Planning factor criteria for BEQ and community support facilities necessary to support the Marine Barracks personnel are contained in the Category Codes series 700. However, under normal conditions, the host activity would be expected to provide all community type support.

14346-3 The following shall be utilized for broad planning purposes when there is an absence of a detailed analysis of functional requirements. Provisions for parking (Category Code 852 10) and small arms pyrotechnic magazine (Category Code 421 48) should utilize the appropriate Category Code.

**Table 14346-1 Marine Barracks**

<b>Military Strength</b>	<b>Gross SF/MN</b>
1-50	75
51-100	65
101-150	55
151-200	45
201 -	For every man over 200, add 30 gross square feet per man

**143 47 ALERT FORCE BUILDING (SF)****FAC: 1446****BFR Required: Y**

14347-1 **DEFINITION.** An Alert Force Building is programmed in conjunction with an Air/Underwater Weapons Shop, Category Code 216 55, when required to meet the Alert Force response times established for the shop. The Alert Force Building provides barracks facilities, including limited messing facilities necessary to accommodate the guard of the day for an AUW Shop. It also contains a duty office, provision for weapons storage and an alarm repeater panel. Space requirements should be generated by an engineering space analysis.

**143 55 TRANSIT SHED (SF)****FAC: 1444****BFR Required: Y**

14355-1 **DEFINITION.** A transit shed is planned to support the rapid and orderly transfer of truck and rail freight in shipment from one carrier to another with minimum storage. For a waterfront transit shed, see Category Code 156 10. The transit shed is of the minimum design that will protect the freight from the weather and provide any security necessary. It may be a roofed shed with open sides or completely enclosed space built to the minimum specifications to provide the required protection. Plan at the rate of 1500 SF per 64 measurement tons (MT) of throughput per day for a peak (assumes 4 FT high stacking, 12 FT aisles for equipment maneuvering)

**143 60 EXPLOSIVES, SHIPPING/TRANSFER DEPOT (SF)****FAC: 1431****BFR Required: Y**

14360-1 **DEFINITION.** An explosives transfer depot is a facility used to transfer break-bulk ammunition and explosives between automotive vehicles and railcars for further shipment, or for delivery to a storage magazine, loading building, waterfront or

airfield. The transfer depot may be in close proximity to a loading platform, a flight line, or a truck or rail center. This facility is typically required only at installations which expend or transship the ordnance materials in large quantities, e.g. NAVWPNSTAs and NAVMAGs. No planning factors are available; however, consider using industry metrics like peak daily throughput in sf/ton per unit of time. This code is not to be used for containerized ordnance; for ordnance moved in ISO (International Standards Organization) containers, use Category Code 148 40, Container Transfer Facility (Ordnance) should be used.

### **143 65 REGION/INSTALLATION OPERATIONS CENTER (SF)**

**FAC: 1431**

**BFR Required: Y**

14365-1 **DEFINITION.** A Region/Installation Operations Facility is a shore mission specific Command, Control, and Coordination (C3) area in direct support of the operations mission of a Region/Installation Navy or Marine Corps Activity. This facility can also be designated as a Regional Operations Center (ROC), Emergency Control Center (ECC), or Emergency Action Center (EAC).

14365-2 **FUNCTIONAL AREAS.** This facility may contain the following functional areas:

- Equipment areas for both classified and unclassified server spaces to support tactical and operational communications systems and networks
- Operations areas to include a Watch Center and a Command Viewing Area
- Operations Analysis Workstations and Special Access Programs (SAP) area

Additional space may be provided to support Special Purpose Spaces such as: Break Room, Conference Room, and a Duty/Bunk Room, as well as Private and Open Office areas to support the small day-to-day operating staff. Additionally, adequate facilities are required to accommodate all operations staff that man the facility during emergency operations. Additionally, due to the nature of the mission of these facilities, an Uninterruptible Power Supply (UPS) system and emergency generator system may be required. See Table 14365-1 for authorized functional areas. An Engineering Evaluation will be used to determine the quantity and type of functional areas required. Please refer to the guidelines provided in the introduction of 131-series Category Codes for C5ISR buildings to calculate the requirement for each functional area. Per section 131-14, the authorized **net-to-gross** factor is 1.45.

14365-3 **BUILDING BLOCKS.** Figure 14365-1 provides a diagram demonstrating a summary of the applicable spaces, appropriate allocation factors, and the special relationship for Region/Installation Emergency Operations Facilities.

**Table 14365-1. Region/Installation Operations Facility Functional Areas**

<b>Functional Area</b>	<b>Sub-space</b>	<b>143 65</b>
Administrative General Purpose	Private Office	J
	Open Office (Cubicle)	A
Special Purpose Space Basic	Admin Support	A
	Break Room	A
	Classified Vault	J
	Conference Rooms/VTC	A
	Duty/Bunk Room	J
	Technical Publications Area	J
Special Purpose Space Fitness/Locker/ Shower	Locker Room	J
	Shower Room	J
Special Purpose Space Security	Quarterdeck/Entry Control	J
	Special Security Office	J
Operations Space	Watch Center	A
	Analysis Operations	A
Equipment Space	Data Center/Server	A
	Communications Security Material Area	J

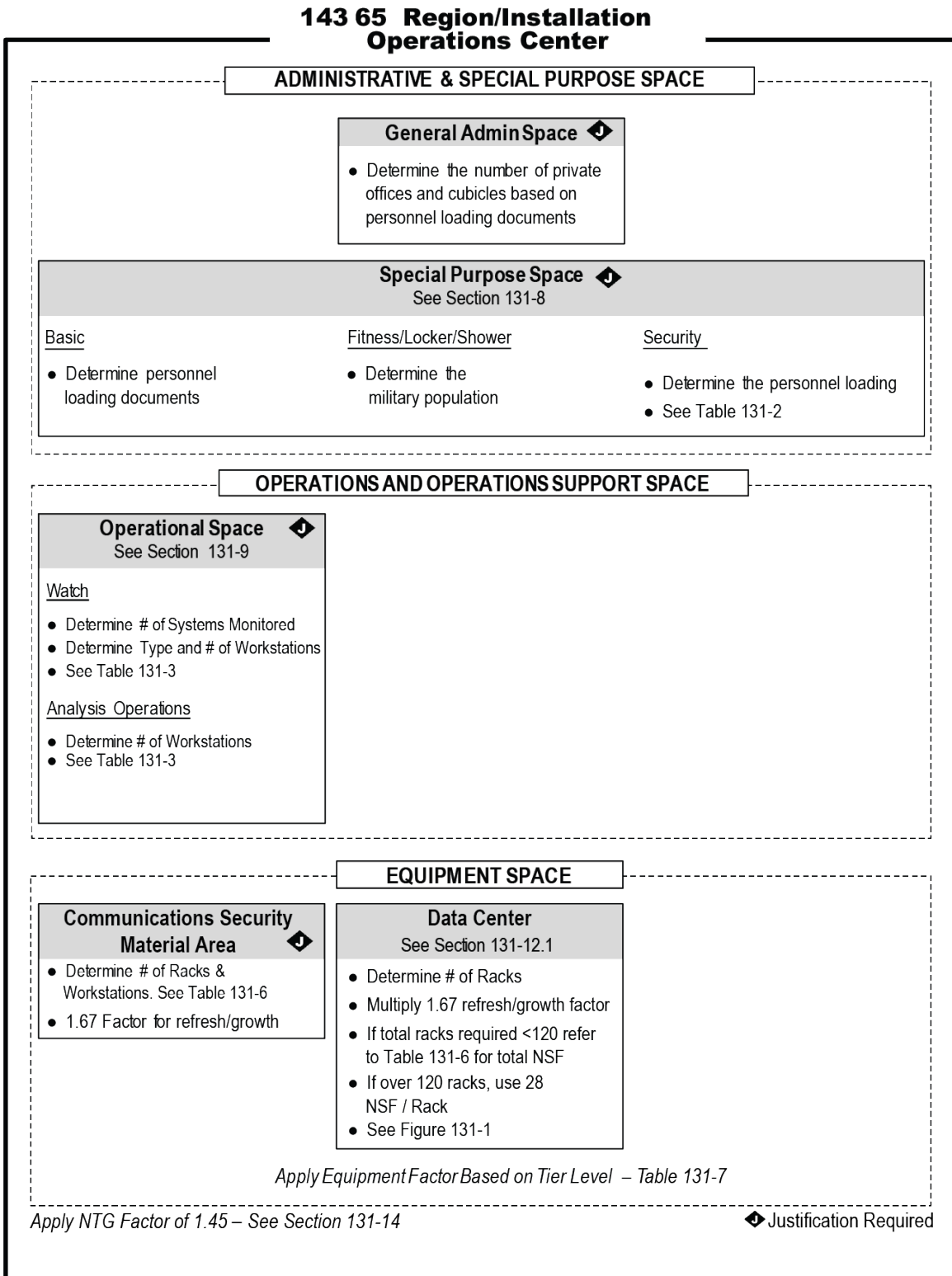
*Legend:*

*A – Approved without additional justification (based on the staffing and mission requirements)*

*J – Only approved with specific justification of mission requirements*



**Figure 14365 -1. Region/Installation Operations Facility Building Blocks Diagram**



**143 70 RADIATION INSTRUMENT CALIBRATION FACILITY (SF)****FAC: 1442****BFR Required: Y**

14370-1 **MONITORING DEVICES.** A health physics calibration building contains facilities required for calibration of health physics survey instruments and area monitoring devices. These devices are used to protect personnel against ionizing radiation from x-rays and atomic particles. The size of the building will depend upon the type and number of instruments being calibrated. Requirements typically include the following:

14370-2 **ADMINISTRATIVE OFFICES.** Refer to Category Code 610 10 guidance to determine the space requirements based on the number of offices needed.

14370-3 **CALIBRATION LAB.** Space consists of electrical and non-electrical workbenches, tool cabinets, and library of technical manuals, safety equipment, and storage of equipment waiting for calibration, storage for repair parts, and file storage for record keeping. The number of workbenches and cabinets must be determined based on the number of instruments being calibrated and number of personnel assigned to this function.

**Table 14370-1. Calibration Lab**

Items	NSF
Workbench (each)	125
Tool cabinet (each)	15
Library for manuals	50
Safety equipment	20
Equipment waiting calibration	80
Replacement parts	200
File storage cabinet (each)	7

14370-4 **Range.** Space consists of area to safely test the survey and monitoring equipment. The requirements will be determined by an engineering evaluation. The number of instruments, frequency of testing, and specific instrument testing requirements will dictate the space required for the range.

**143 75 POL OPERATIONS/SAMPLING/TESTING BUILDING (SF)****FAC: 1442****BFR Required: Y**

14375-1 **DEFINITION.** The POL operation building provides space required for quality control and administration of fuel activity. Space is provided in the building for an administrative office, control/gauge monitoring center, and fuels testing laboratory. Physical operation and control of the fuel system will be accomplished elsewhere (such

as the pump house). Each person not working in the lab should be assigned desk space not to exceed 162.5 GSF. This gross area allows for wall thickness, corridors and other general circulation, mechanical rooms, and rest rooms. Supervisor may be provided with private offices. The lab area and control monitoring center requirements will be based on engineering field analysis of the spaces. For the lab and control center only, a net-to-gross multiplier of 1.45 may be used. This multiplier will account for wall thickness, corridors, and circulation around equipment, mechanical rooms, and rest rooms.

### **143 77 OPERATIONAL STORAGE (SF)**

**FAC: 1443**

**BFR Required: Y**

14377-1 **DEFINITION.** Operational Storage supports multiple Departments/Divisions within a command. It is under the control of the Logistics and Supply Department. This Category Code is used to identify areas used for bulk storage areas of major end items, and operational material. Storage of material under the control of the Communications Department should be classified within Category Code 217 77.

14377-2 Storage facilities for equipment related to operational facilities will be provided only where it can be individually justified. There are no criteria for this type of facility. General information on normal stacking heights, SF per measurement ton requirements, and other parameters are provided in Category Code 440 series.

### **143 78 OPERATIONAL HAZARDOUS/FLAMMABLE STORAGE (SF)**

**FAC: 1443**

**BFR Required: Y**

14378-1 **DEFINITION.** This category will be used to provide a facility for the storage of materials used in daily operations that require special environmental separation. These materials such as paint, acetone, oil, etc. are considered to be hazardous and/or flammable. Personnel or storekeeper that may be assigned to this facility should be provided with a separate office space not to exceed 162.5 NSF. An engineering field analysis will be required to determine the warehouse space based on quantity of materials stored. Racks or shelves will be used to reduce footprint. Some materials may not be mix or must be divided by berms or firewalls and this separation space should be added to calculations. These facilities may require some environmental controls and ventilation. If quantity is palletized allow for forklifts in aisle ways or access through overhead doors. Reference the 440 series for assistance on converting CF to NSF.

14378-2 Facility should be close to or an extension of other warehouse space, therefore other personnel support spaces (i.e., restrooms, break area, lockers, etc.) are not required. Operational commands store small quantities of materials and small facilities under 1000 NSF are typical. For hazardous waste, see category codes 831 41/42.

**143 80 MISSION OPERATION COMMAND AND CONTROL FACILITY (SF)****FAC: 1404****BFR Required: Y**

14380-1 **DEFINITION.** A Mission Operation Command and Control Facility is a specialized facility that is only required in select locations to support the operations of Force Commanders and Fleet Commanders (e.g. US Fleet Forces Commander, Pacific Fleet) and selected others as established by DoD. A Mission Operation Command and Control Facility may also contain facility requirements for Type Commands (e.g. AIRLANT, SUBPAC), Operational Support Commands (e.g. CTF and CTG) and a Maritime Operations Center (MOC).

14380-2 **SPECIALIZED REQUIREMENTS.** A Mission Operation Command and Control Facility contains the total requirements for office space, special purpose space, operations spaces, maintenance spaces, training spaces, equipment space, and limited IT logistics support space. The technical and operational mission of this facility may require that it contain: Secure Compartmented Information Facility (SCIF) areas, an Uninterruptible Power System (UPS), emergency generator system and in select cases, TEMPEST countermeasures may be required such as Radio Frequency (RF) shielding, Protected Distribution Systems (PDS), and signal/power line isolation and filters. Although a Communications, Information, Intelligence Facility (Category Code 131 15) and/or a Satellite Communications Facility (Category Code 131 24) may be collocated on station with a Mission Operation Command and Control Facility, the Mission Operation Command and Control Facility may contain dedicated communication architecture and operational systems that require it to have its own connectivity via direct satellite systems.

14380-3 **FUNCTIONAL AREAS.** This facility may contain the functional areas outlined in Table 14380-1. In instances where Type Commands (e.g. AIRLANT, SUBPAC) and Operational Support Commands (e.g. CTF or CTG) are collocated with the operating force within the Mission Operation Command and Control Facility, a separate analysis shall be calculated for each respective command to determine their specific requirements. An Engineering Evaluation will be used to determine the quantity and type of functional areas required. Please refer to the guidelines provided in the introduction of 131-series Category Codes for C5ISR buildings to calculate the requirement for each functional area. Per section 131-14, the authorized **net-to-gross** factor is 1.45.

14380-4 **BUILDING BLOCKS.** Figure 14380-1 provides a diagram demonstrating a summary of the applicable spaces, appropriate allocation factors, and the special relationship for Mission Operation Command and Control Facilities.

**Table 14380-1. Mission Operation Command and Control Facility Functional Areas**

<b>Functional Area</b>	<b>Subspace</b>	<b>143 80</b>
Administrative General Purpose	Private Office	A
	Open Office (Cubicle)	A
Special Purpose Space Basic	Admin Support	A
	Break Room	A
	Break Room Kitchen	J
	Classified Vault	J
	Conference Rooms/VTC	A
	Duty/Bunk Room	J
	Mail Room	J
	Technical Publications Area	J
Special Purpose Space Fitness/Locker/ Shower	Fitness Room <sup>1</sup>	J
	Locker Room	J
	Shower Room	J
Special Purpose Space Security	Quarterdeck/Entry Control	A
	Special Security Office	J
Operations Space	Watch Center	A
	Analysis Operations	A
Maintenance Space	Maintenance	J
Training Space	Training	J
IT Logistics Support Space	IT Logistics Support Space	A
Equipment Space	Data Center/Server	A
	Commercial Services Equipment	J
	Communications Security Material Area	J
	Network Distribution Area	J
	Specialized Equipment	J

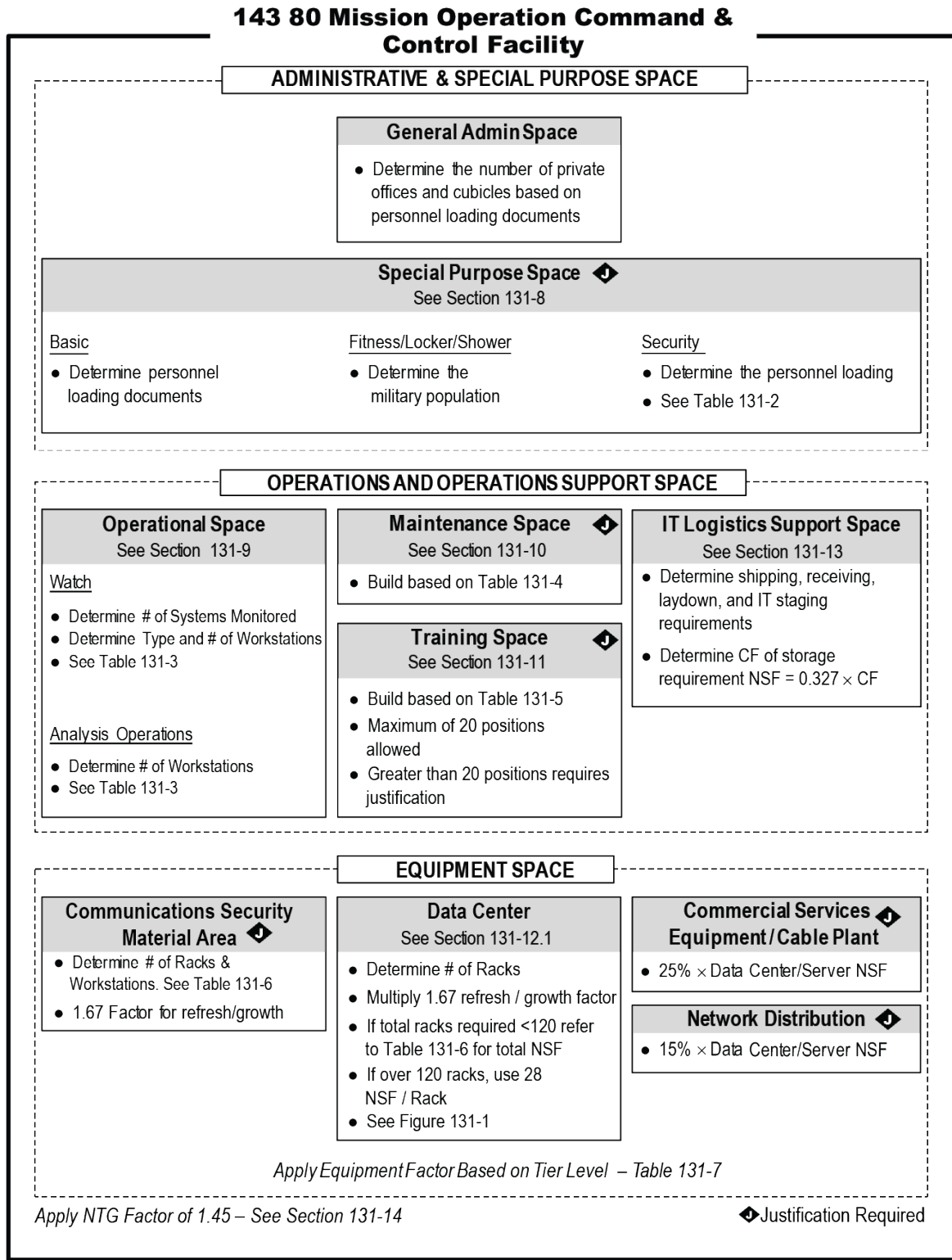
**Legend:**

*A – Approved without additional justification (based on the staffing and mission requirements)*

*J – Only approved with specific justification of mission requirements*

*(1). This requirement should be captured under CCN 740 45. Fitness Rooms are only allowed in accordance with CNICINST 1710.1 where by the command is located more than a 15- minute commute by vehicle from the nearest Morale Welfare and Recreation (MWR) Fitness Center, or in cases where service members are required to be on station and unable to leave for 18 hours at any given time. The fitness room must also have approval from the Installation Commanding Officer.*

**Figure 14380-1. Mission Operation Command and Control Facility Building Blocks Diagram**



Apply NTG Factor of 1.45 – See Section 131-14  Justification Required

**143 85 JOINT RESERVE INTELLIGENCE CENTER (JRIC) (SF)****FAC: 1444****BFR Required: Y**

14385-1 **DEFINITION.** Joint Reserve Intelligence Center (JRIC). A JRIC is a joint intelligence production and training activity that uses information networks to link reservist intelligence personnel, active duty units and contractors with the combatant commands, Services, and/or combat support agencies. A JRIC is located within a Service-owned and managed sensitive compartmented information (SCI) facility and may also include surrounding collateral and unclassified areas involved in the performance and direct management of intelligence production work that uses Joint Reserve Intelligence Program infrastructure and connectivity. The JRICs located around the country are equipped to effectively serve as satellite elements to combatant command Joint Intelligence Operations Centers (JIOCs), however they are shared facilities that serve multiple customers and missions.

14385-2 A JRIC contains the total requirements for office space, intelligence production space, support space, equipment and communications spaces, maintenance and training spaces, and limited storage space. The technical and operational mission of a JRIC will require that it contain, Secure Compartmented Information Facility (SCIF) areas, an Uninterruptible Power System (UPS), emergency generator system(s), and in selected cases, Radio Frequency Interference (RFI) shielding, Electromagnetic Interference (EMI) shielding, and Telecommunications Electronics Material Protected from Emanating Spurious Transmissions (TEMPEST) protection. It may contain dedicated communications architecture and operational systems that require it to have its own connectivity via direct satellite systems. The JRIC uses DIA/DoDIIS/DS-OGT for infrastructure and connectivity in "state of the art" Data Centers located within the SCIF.

14385-3 A JRIC may contain the functional areas outlined below.

14385-3.1 **Office Area.** Areas are provided for, but not limited to, the Site Manager (Officer in Charge), Administrative Staff, JRIC Operations Officer and JRIC Site Systems Administrator. Additional office space may be required to support the (Reserve Intelligence Area) Commander, Deputy, Chief of Staff, Command Support Staff (N-00), Special Staff (N-01/02), DCOS Manpower and Personnel (N-1), DCOS Intelligence and immediate Support Staff (N-2), DCOS Operations and immediate Support Staff (N-3), DCOS Logistics/Supply/Material and immediate Support Staff (N-4), DCOS Plans and Policy and immediate Support Staff (N-5), DCOS & Combat Systems and immediate Support Staff (N-6), DCOS Tactics and immediate Support Staff (N-7), DCOS Requirements, Readiness, and Assessment and immediate Support Staff (N-8).

14385-3.2 **Support Area.** The following support areas are normally required.

- **Reception Area.** A reception area, normally shared by the Commander, Deputy Commander, and Chief of Staff is required. This area should be capable of accommodating a minimum of eight (8) personnel. This is essentially a screening area for un-cleared personnel. This includes receptionist and visitors.

- **Commanders Conference Room.** A Conference Room normally shared by the Commander, Deputy Commander, and Chief of Staff capable of supporting a minimum of eight (8) personnel may be required.
- **Conference/Classroom Room.** Requirement is predicated on Base Loading/Stationing plan of supported units/activities.
  - **Command VTC/Conference Room.** A large area performing the function of an Auditorium/Conference Room may be required. The size of this area is dependent on the stationing/base loading plan, staffing and size of the JRIC.
  - **Break/Lounge/Galley Area.** As a result of the operational hours maintained within this facility, a small break/lounge/galley (kitchenette) area is required.
  - **Quarterdeck Area.** This multifunctional area provides an assembly or holding area for visitors awaiting escort, badge and pass issue and verification, and is considered the central point for ingress/egress. The quarterdeck will normally contain a maximum of two workstations requiring approximately 200 NSF.
- **Technical Publications Area.** This area may be required to store reference publications and literary data. It is configured similarly to a reference library in that it contains bookshelves, a reference area, and a working space for a minimum of two people requiring approximately 190 NSF.

14385-3.3      **Operational Area.** Not every JRIC will contain all of the areas listed, and there may be slight differences in terminology of the areas referenced below as a result of geographic specialization required at each respective location. In addition, although intended as a guide, the specific size of the areas provided below may vary as a result of the stationing/base loading plan and mission of the respective JRIC. An Engineering Evaluation will be used to determine the quantity and type of space required. Guidance provided within the Category Code series applied will be used \* (see notes below).

- **Intelligence Operations Center.** This operational area is typically configured as a two to three room suite. The first area supports Operational Intelligence Production/Evaluation. This area will be configured based on mission essential tasks/functional requirements, be comprised of a certain number of A, B and C type workstations and include a conference area/collaborative multi-disciplinary work space with a table capable of seating eight (8). The second area supports Strike/Targeting production. This area will be configured based on mission essential tasks/functional requirements, be comprised of a certain number of A, B and C type workstations and include a conference area/ collaborative multi-disciplinary work space with a



table capable of seating eight (8). The third area supports Special Warfare intelligence production. This area will be configured based on mission essential tasks/functional requirements, be comprised of a certain number of A, B and C type workstations and include a conference area/ collaborative multi-disciplinary work space with a table capable of seating eight (8). Within the center there may be areas designated as Special Access Programs (SAP) areas (see below), which may contain a conference area with a table capable of seating eight (8), one type A workstation, video displays and wall maps, and support equipment (scanners, printers, copiers, et cetera).

A workstation = Connectivity to three (3) systems  
(JWICS/SIPRNet/DNI-U)

B workstation = Connectivity to two (2) systems  
(JWICS/ SIPRNet/DNI-U)

C workstation = Connectivity to one (1) system  
(JWICS/ SIPRNet/DNI-U)

• **Imagery Exploitation/Production Area.** The Imagery Production Area may contain up to three (3) separate areas as follows:

a. **Imagery Analysis Area.** This area may be divided into separate rooms each of which supports up to twenty (20) personnel and contains imagery technician workstations, plotters and printers. The governing reference for design of these spaces is the National Geospatial-Intelligence Agency (NGA) Exploitation Facility Design Guidelines, version 2.1 dated 21 December 2006.

b. **Production Area.** This area contains one type A workstation, large format plotter, layout tables, light tables and imagery processor equipment.

c. **Administrative, Reference and Storage Area.** This area contains one type A workstation, bookshelves & map flats for imagery materials & supplies and administrative support equipment.

d. **Collaborative multi-disciplinary work space.** This area will include a conference area with a table capable of seating eight (8) and may be co-located with the imagery production area.

The minimum imagery exploitation space allocation for any JRIC will be a four (4) workstation room.

#### 14385-3.4 **Operational Support Area**

**JRIC Support Suite.** The JRIC Support Suite may contain up to four (4) areas as outlined below.

- **Data Center.** This area typically contains one Type C workstation and a single row of six to ten racks of servers. An Uninterruptible Power Source (UPS) system and emergency generator system supporting this equipment is required for continuous operations capability. This area is also supported with a remote environmental monitoring system and a gas fire suppression system.
- **JRIC Operations Officer Area.** This area typically contains one unique conference table configuration capable of seating up to eight (8) personnel, a Type A workstation, and large wall mounted video display and maps.
- **JRIC Site System Administrator (JSSA) Area.** This area typically contains one Type A workstation and administrative support equipment (scanners, printers, copiers et cetera).
- **Secure Storage.** This area will contain secure storage containers as approved by the supporting Special security office (SSO).

**DIA/DoDIIS-DS/OGT Support Area.** An area is required for DIA/DODIIS-DS/OGT servers associated with the JWICS, SIPRNet and DNI-U. This area functions as the technical control and monitoring point for DIA/DODIIS-DS/OGT connectivity. This area may be co-located with the Data Center.

Minimum connectivity requirements: Each JRIC will receive connectivity based on unit/activity/agency mission requirements. The minimum JRIC standard is:

<u>System</u>	<u>Circuit Size</u>	<u>Quantity</u>
JWICS	OC-3 line	1
SIPRNet	DS-3 line	1
DNI-U	DS-3 line	1

In addition each line will have a “back-up” or redundant circuit which will be sized in order to meet minimum mission requirements.

**Special Security Officer (SSO) Suite.** The SSO Suite associated with a JRIC Facility is a multifunctional area containing, but not limited to, a Reception Area, Indoctrination Area, Photography Area, and Vault requiring approximately 280 NSF. Office space for the SSO and associated support staff are located within the SSO Suite, but special requirements for them should also be contained within the Office Area above. The SSO Suite is considered a secure area and must meet Sensitive Compartmented Information Facility (SCIF) criteria.

**Secure VTC/Briefing Area.** This area will normally be configured for a minimum of fourteen (14) personnel. It will contain video monitors, cameras, conference room seating, a computer workstation, Smart/white boards, briefing boards for large charts and video displays. A rear screen projection room may also be required in this area.

**Mission Critical Communications Equipment Area.** The Mission Critical Communications Equipment Area is unmanned. It may contain IEMATS consoles and processors, SATCOM terminals, UHF voice consoles and equipment, an EMATS fiber optic interface, WWMCCS, JWICS, and other applicable information data base terminals. An Uninterruptible Power Source (UPS) system supporting this equipment is required to sustain continuous operations. Secure telecommunications is a standard requirement (e.g., Standard Telephone Units (STU) analog systems and/or Standard Telephone Equipment (STE) digital systems), to be located as mission dictates.

**Mission (Operations) Cells.** In addition to the Operations and Operational Support Areas addressed above, selected JRIC's may require specialized Mission Cells. These cells may include, but are not limited to unique mission requirements or mission requirements incompatible with the supported units, activities or agencies (e.g., Force Cryptology Area, Fleet Support/Collection Management Area, Crisis Management Cell Area, et cetera). Each respective cell is arranged in a specific configuration, which will include a mix of rack mounted, and PC based systems. An Engineering Evaluation is to be used to determine the total number of cells required, quantity of racks and workstations associated with each respective cell.

**Agency Support Area.** The Agency Support Area is sized based on staffing. Agency personnel may be addressed under Office Area, and will only be contained within the Equipment and Operational Area if required by unique security issues.

**Special Access Programs (SAP), Compartmented Area (CA).** In accordance with Intelligence Community Policy Memorandum, Number 2006-700-7, dated 12 JUL 2006, Subject: Intelligence Community Modifications to DCID 6/9 Physical Security Standards for Sensitive Compartmented Information Facilities (SCIF's). A CA is a room, or set of rooms, located within a SCIF designed to enforce need-to-know. A CA is required when different compartment programs are sharing the same SCIF and not all SCIF personnel are cross-briefed. CA areas are mission specific and require an Engineering Evaluation.

14385-3.5      **Maintenance and Training Area.** Although not every JRIC Facility will contain all the areas listed, they are provided below as a guide. In instances where the respective allowances for the systems do not reflect configurations at the

site, an Engineering Evaluation will be used to determine the quantity and type of spaces required and guidance provided within the Category Code series will be applied.

**System/Task Training Areas.** Individual JRIC's may require dedicated 'modified academic' training areas. Training covers instruction and hands-on applications with operational equipment to provide Activity/Agency personnel, as well as Fleet personnel, with operator skills on existing and recently deployed systems. As CNO/CNI/DIA directives and operational requirements determine these classes, no formal yearly class schedule is established. Historical data shall be obtained on class sizes and the planning factor outlined in Category Code series 171 of UFC/NAVFAC P-80 of 45 nsf/pn applied.

**Command Training Area.** This academic training area is required to satisfy general training requirements for all of the RIA and JRIC units/activity/agency personnel. Training requirements cover general topics, which include but are not limited to, Quality of Life, Career Enhancement, Administrative, Educational Services, and Command Initiative Programs.

**System/Task Maintenance Areas.** Individual units and/or agencies may require dedicated systems/tasks maintenance areas. These maintenance areas may be configured with equipment racks and PC based workstations. An Engineering Evaluation and/or historical data shall be used to determine the quantity and configuration required for mission support, and guidance provided within the Category Code series section applied.

**Flexible Secure Working Area (FlexSWA).** To accommodate a broad range of system/ task training and command training requirements, where there is limited space availability for the JRIC, or greater space flexibility is required, it is possible to design and develop a Flexible Secure Working Area that is built to SCIF standards (DCID 6/9 requirements), but is configured to accommodate multiple functions and all levels of work, from unclassified up to TS/SCI, as required.

14385-3.6 **Storage Area.** A dedicated storage area may be provided for each unit/activity within the JRIC Facility. Allowance is based on Tables of Allowances/Modified Table of Organization and Equipment or equivalent.

**Common Support Space Requirements.** Note: Restrooms are required in both the SCIF and unclassified spaces. The restrooms in the unclassified spaces should have showers to support the full-time staff.

General. A JRIC is a remote joint service intelligence production and training activity that uses information networks to link reservists, active-duty units and contractors with

the Combatant Commands, Services, and/or Combat Support Agencies (C/S/A). A JRIC is located within a DoD-owned and managed Sensitive Compartmented Information Facility (SCIF) and surrounding collateral/unclassified areas involved in the performance and direct management of intelligence production work that uses JRIP (Joint Reserve Intelligence Program) infrastructure and connectivity. JRIC's provide interoperable intelligence support systems on which reserve elements simultaneously fulfill their intelligence support missions/production requirements and train on their Mission Essential Tasks. Reference: DoD Directive 3305.7, "Joint Reserve Intelligence Program (JRIP). For specific design information, please contact NAVFAC Atlantic Asset Management division.

**144 40 SCALE HOUSE (SF)**

**FAC: 1444**

**BFR Required: N**

14440-1 **DEFINITION.** A building that provides a protective enclosure for the operator of a vehicle/railcar weighing station. Sizing will be on a case-by-case basis and no criteria is available.

**148 SHIP AND OTHER OPERATIONAL FACILITIES -  
OTHER THAN BUILDINGS**

148-1 **GENERAL.** This category group contains facilities and structures which support tactical or organizational ship and other land operations in which do not fall readily into another category. For facilities supporting aircraft operations, use category group 149.

**148 10 SHIP PROPULSION SUPPORT FACILITY (EA)**

**FAC: 1481**

**BFR Required: Y**

14810-1 **DEFINITION.** Planning and programming for this facility requires concurrence and planning guidance by NAVSEA Code 08.

**148 15 SHIP WEAPONS HANDLING FACILITY (EA)**

**FAC: 1491**

**BFR Required: Y**

14815-1 **DEFINITION.** No planning factors are available. Each facility requires individual justification and space requirements; please contact Director, Strategic Systems Program (SSP) Office.

**148 17 SPACE SURVEILLANCE ANTENNA (EA)****FAC: 1456****BFR Required: N**

14817-1 **DEFINITION.** Requirements are determined by Naval Network and Space Operations Command. Facilities typically support global space surveillance network which detects, tracks, identifies, and catalogs man-made objects in space and provides position information on these objects.

**148 20 ORDNANCE DEMOLITION AREA (EA)****FAC: 1783****BFR Required: Y**

14820-1 **DEFINITION.** An ordnance demolition (treatment) area is a location specifically designated and reserved for destroying explosives and explosives-loaded devices. The function typically means burning or detonating explosives in a bermed open burn/open detonation (OB/OD) area. Coordinate justification for this area with the EOD units or other users. Planning and scoping this facility should consider governing environmental federal and state regulations, user requirements and explosive safety criteria. This area must meet the requirements of NAVSEA OP-5 Vol.1 and OPNAVINST 3770.2 (series) for FAA clearance requirements. All ordnance demolition (treatment) areas located in the United States and U.S. territories are required to have a Resource Conservation and Recovery Act (RCRA) permit. The shelter/bunker for the demolition area will be captured under CCN 173-40 Observation Tower/Bunker. Use Category Code 178 30 for a demolition training range.

**148 25 EXPLOSIVE TRUCK HOLDING YARD (SY)****FAC: 8526****BFR Required: Y**

14825-1 **DEFINITION.** This yard is where trucks containing ammunition and/or explosives are held for interim periods of time prior to storage or shipment. Safe havens and wharf yards near piers and wharves should be categorized under this function. Each facility requires individual justification. Depending on land constraints and explosive safety criteria these facilities may or may not be barricaded. For containerized ordnance, use Category Code 148 35, Container Holding Yard.

**148 30 EXPLOSIVES RAILROAD CAR HOLDING YARD (EA)****FAC: 1493****BFR Required: Y**

14830-1 **DEFINITION.** This is a temporary holding area for railcars containing ordnance prior to storage or shipment. Each facility requires individual justification. Depending on land constraints and explosive safety criteria these facilities may or may

not be barricaded. For containerized ordnance use Category Code 148 35, Container Holding Yard.

### **148 35 CONTAINER HOLDING YARD (SY)**

**FAC: 8526**

**BFR Required: Y**

14835-1 **DEFINITION.** This is an open area that provides a temporary holding or staging area for containers loaded with explosive ordnance. Wharf yards near piers and wharves are also described by this function. Containers with explosive ordnance class/ Division 1.1 and 1.2 may or may not be in a bermed/barricaded area. Loaded containers can be stacked two high or singly on chassis or flatbed trailers. No planning criteria are provided because of the multiple container handling equipment possibilities and container configurations. A simple layout sketch of the proposed container holding

area, allowing for safe maneuvering of the container handling equipment, will generate the required space requirements.

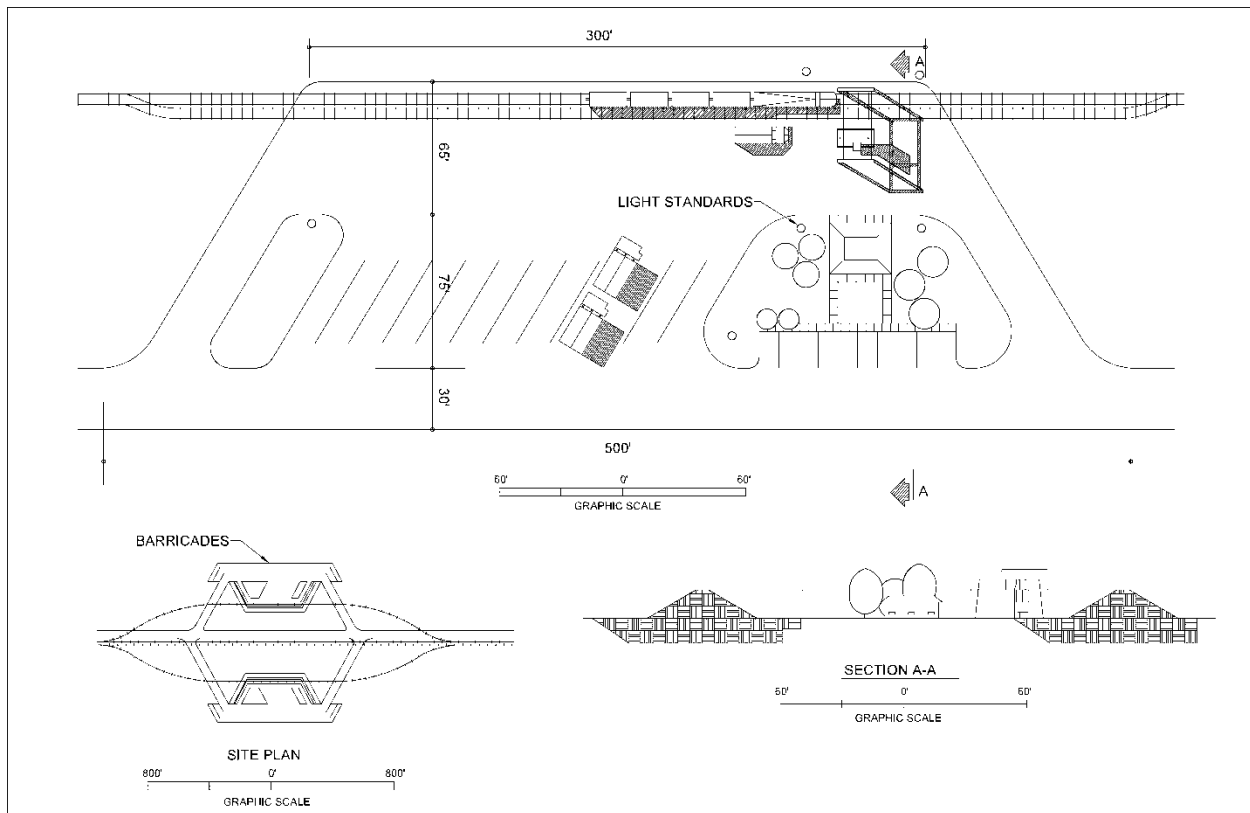
14835-2 Minimum holding capacity of all holding yards should approximate one shipload of containers or the equivalent of 24 hours of sustained out-loading for the particular terminal operation.

### **148 40 CONTAINER TRANSFER FACILITY (ORDNANCE) (SY)**

**FAC: 8526**

**BFR Required: Y**

14840-1 **DEFINITION.** A container transfer facility is used to transfer containers between rail flatcars and truck flatbeds or chassis, on a paved hardstand area, by means of a bridge crane or container handling equipment. Scale equipment should be expected to a part of this function. The area may be barricaded or unbarricaded. The size of the facility should be capable of handling a sustained maximum out-loading for the number of container throughput served in a 24-hour period. Determine the standard transfer rates given the type of container handling equipment. The mix of arrivals and departures of containers on rail or truck requiring transfer determines the how much material handling equipment is necessary to sustain the maximum out-loading. The area of paved hardstand and parking is dictated by the rate of container arrivals and departures. The control and service building of 204 SF provides office space, toilet facilities, etc. for employees. See Figure 14840-1 for a notional transfer facility using a bridge crane.



**Figure 14840-1 Container Transfer Facility (Ordnance)**

#### **148 45 RAIL/TRUCK RECEIVING STATION (ORDNANCE) (SY)**

**FAC: 8526**

**BFR Required: Y**

**14845-1 DEFINITION.** A rail/truck receiving station weighs and inspects all incoming shipments of break-bulk and containerized ordnance arriving by rail or truck and also a percentage of the outgoing shipments. Also, this station can be used as a short term storage facility limited to overnight and weekend periods and as an interchange storage facility limited to overnight and weekend periods and as an interchange yard between common carrier and station. The capacity of the receiving, inspecting, and weighing facility is based on expected maximum truck and rail arrivals and departures during a sustained out-loading. Figure 14845-1 provides a notional layout for a high-volume ordnance receiving and inspection station. This notional facility can process 20 rail cars per hour and 20 trucks per hour and provide for a 40-truck parking area and 100 rail car siding. It contains two rail inspection pits and two truck inspection pits, scales, lighting, and 2,432 SF of administrative space.



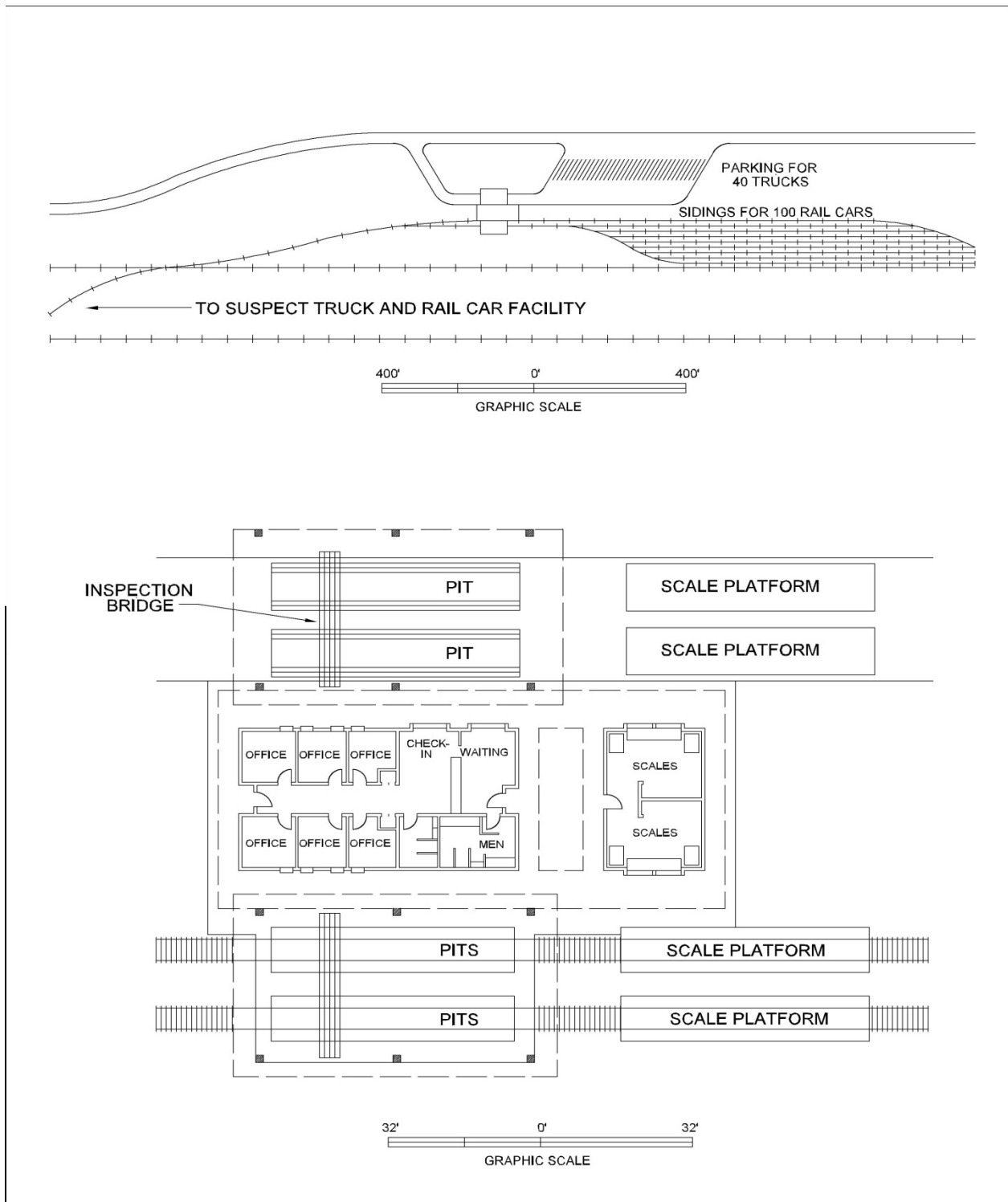


Figure 14845-1 Rail / Truck Receiving Station (Ordnance)

## 149 OPERATIONAL FACILITIES- OTHER THAN BUILDINGS

149-1 **GENERAL.** This category group contains facilities such as towers and structures which support tactical or organizational aircraft related operations and which do not fall readily into another category. It includes protective construction.

### 149 10 AIRCRAFT REVETMENT (EA)

**FAC: 1495**

**BFR Required: N**

**Design Criteria:** None Available

14910-1 **DEFINITION.** Protective Barricades (also known as revetments) are constructed at locations where explosive safety dictates the need, such as in magazine areas, combat aircraft loading areas, etc. They can be either steel structures or man-made earthen berms.

Aircraft revetments are constructed only for emergencies or in combat zones for the protection of aircraft against fire, blast, or enemy action. Aircraft revetments will be sized according to the aircraft that it is to protect. Specific criteria for this requirement will be determined by field conditions and will be planned only on specific instructions of the Fleet or Area Commander. For planning purposes, the unit of measure is each (ea); that is, the number of protected aircraft sites.

Explosive barricades for suspect truck or rail cars are captured under CCN 860 20, Explosive Barricade for Suspect Trucks and Railroad Cars.

14910-1 **DEFINITION.** Aircraft revetments are constructed only for emergencies or in combat zones for the protection of aircraft against fire, blast, or enemy action. Aircraft revetments will be sized according to the aircraft that it is to protect. Specific criteria for this requirement will be determined by field conditions and will be planned only on specific instructions of the Fleet or Area Commander. For planning purposes, the unit of measure is each (ea.); that is, the number of protected aircraft sites.

### 149 15 FIXED POINT UTILITIES SYSTEM (EA)

**FAC: 1467**

**BFR Required: Y**

**Design Criteria:** UFC 4-121-10N, Aircraft Fixed Point Utility Systems

**Planning Criteria:** P-80.3, Aviation Operation and Support Facilities; UFC 3-260-01, Airfield and Heliport Planning and Design

14915-1 **DEFINITION.** Fixed Point Utilities Systems (FPUS) supply utilities to aircraft parking apron service points and aircraft maintenance hangar service point. The

FPUS can provide compressed air, preconditioned air for hangared aircraft, and/or electrical power. The system can consist of an enclosed pump house and storage tanks, an in-ground distribution system and service points in aircraft parking aprons or aircraft maintenance hangars. There are typically four types of systems:

1. Air Start System. Provides compressed air at the parking apron. Aircraft cooling is provided by mobile ground carts. Electrical power is provided by separate, dedicated service panels.
2. Environmental Control System. Provides compressed air for engine starting and environmentally controlled compressed air for aircraft cooling from a central source. Electrical power is provided by separate, dedicated service panels.
3. Flight Line Electrical Distribution System (FLEDS). Provides electrical power to aircraft parked on the aircraft parking apron.
4. Point of Use Frequency Converter System (Super Flight Line Electrical Distribution System (SFLEDS)). Provides conditioned (filtered and compensated) electrical power to aircraft parked on the aircraft parking apron.

Layout of FPUS shall be subject to the correlated siting of maintenance hangars, parking apron and taxiways. Aircraft parking and FPUS layout is prescribed under Aircraft Parking Apron, Category Code 113 20 and UFC 3-260-01, Airfield and Heliport Planning and Design.

#### **149 20 AIRCRAFT CATAPULT (EA) (DELETED)**

**This CCN has been deleted because it is non-RP (the catapult system is equipment). However, the support building(s), which can be above or below ground, are now captured under CCN 319 10 MISCELLANEOUS EQUIPMENT AND ITEMS LABORATORY.**

#### **149 30 AIRCRAFT ARRESTING GEAR (EA)**

**FAC: 1461**

**BFR Required: N**

**Design Criteria:** AFI 32-1043, Managing, Operating, and Maintaining Aircraft Arresting Systems, FAA AC 150/5220-22B, Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns

**Planning Criteria:** UFC 3-260-01, Airfield and Heliport Planning and Design

14930-1 **DEFINITION.** Aircraft arresting gear is designed to bring an aircraft to a stop in case of an aborted takeoff or an emergency landing.

Aircraft arresting systems consist of engaging devices and energy absorbers. Engaging devices are net barriers, disc supported pendants (hook cables), and cable support systems that allow the pendant to be raised to the battery position or retracted below the runway surface. Energy absorbing devices are ships anchor chains, rotary friction brakes, such as BAK-9 and BAK-12, or rotary hydraulic systems such as the BAK-13

and E-28. The systems designated “Barrier, Arresting Kit” (BAK) are numbered in the sequence of procurement of the system design. There is no connection between the Air Force designations of these systems and their function. Other designations such as E-5, E-28 and M-21 are U.S. Navy designations. The U.S. Air Force systems in use today are MA-1A; E-5; BAK-9; BAK-12; BAK-13; BAK-14; 61QSII (BAK-15); E-28; and Textile Brake. Other types of systems include the Mobile Aircraft Arresting System (MAAS) and Soft-Ground Type Aircraft Arresting System/Engineered Material Arresting System (EMAS).

14930-1.1       **E-5.** This unidirectional emergency arresting system is a U.S. Navy design and designation. Much like the MA-1A, this system uses several shots of ships’ anchor chain as the energy absorber, but these systems are never connected with a barrier (net). These systems can have from 1 to 4 disc-supported hook cables, with designations of E-5 and E-5 Mod 1 through E-5 Mod 3.

14930-1.2       **E-28.** The E-28 aircraft arresting system is a rotary hydraulic arresting gear that will accommodate a maximum aircraft weight of 35,400 kg (78,000 lbs) and a maximum aircraft engaging speed of 293 km/hr (160 knots). Aircraft engaging the E-28 arresting gear are stopped within a runout distance of approximately 305 meters (1,000 feet). Engagement can be made from either runway direction and at points up to 12.1 meters (40 feet) on either side of the runway centerline. The high performance (Model E-28) type of arresting gear is planned for both primary and secondary (crosswind) runways. Normally, two sets of arresting gear are required for each operative runway; one at each end between 274 meters (900 feet) and 457 meters (1,500 feet) inboard from the runway threshold. Midpoint arresting gear may be included on the station BFR when justified by runway or operational conditions and when approved through appropriate channels.

14930-1.3       **M-21.** The M-21 aircraft arresting system is a lightweight high-capacity arresting system for the recovery of aircraft. The arresting engines utilize the vortex principle of energy absorbing in a hydrodynamic braking system.

14930-1.4       **MA-1A.** The MA-1A emergency arresting system consists of a net barrier and cable system designed to engage the main landing gear of an aircraft. Because it is a unidirectional system, it must always be installed in the overrun area. Most MA-1A systems employ ships’ anchor chains as the energy absorber. These systems require a runout area of at least 259 meters (850 feet) plus the length of the aircraft. The chains lie on either side of the runway overrun, beginning at the barrier location and running in the direction of aircraft travel; however, some MA-1A systems use a BAK-9 instead of a ships’ anchor chain as the energy absorber. These systems require a runout area of at least 290 meters (950 feet) plus the length of the aircraft. *The MA-1A is not currently in production as a system.*

14930-1.5       **BAK-9.** The BAK-9 is an obsolete bi-directional emergency arresting system. It consisted of 1 energy absorber that employed 2 rotary friction brakes and purchase-tape reels mounted on a common shaft. The reels were mechanically connected at the midpoint by a third brake that acted as a clutch. This allowed each reel to turn at different speeds during off-center engagements and

helped steer the aircraft toward the center of the runway. The energy absorber for these systems was installed below grade on 1 side of the runway and the purchase tape was routed to the opposite side of the runway through deflector sheaves and duct. The other purchase tape was routed to a turnaround sheave located in a pit sited to allow both purchase tapes to be of equal length. *The BAK-9 is not currently in production as a system and should not be considered as a suitable system for a new requirement.*

14930-1.6      **BAK-12.** The BAK-12 is the standard U.S. Air Force operational aircraft arresting system. This bi-directional system employs 2 energy absorbers. Each absorber consists of 2 multi-disc rotary friction brakes mounted on either side of the purchase-tape reel on a common shaft. The energy absorbers are located on opposite sides of the runway, connected to a 32 millimeter (1.25 inch) disc-supported pendant by the purchase tape. Ideally, the energy absorbers should be in a below-grade pit with a minimum split distance of 15.24 meters (50 feet). (Split distance is a measurement taken between the lead-on sheave of the fairlead beam or deck sheave, and the energy absorber.) Split distances of up to 91 meters (300 feet) are acceptable for all BAK-12 installations. You may also install BAK-12 systems above ground in one of two configurations, the selection depending upon site conditions and operational requirements. These are the expeditionary installation for periods of up to 1 year, and the semi-permanent installation, well-suited for long term use and typically selected when site conditions will allow a pit-type installation.

Originally, BAK-12 energy absorbers were fitted with a 60-inch purchase-tape storage reel. This design allowed the maximum energy expected to be imparted during an aircraft engagement to dissipate within a runout of 290 meters (950 feet) plus the length of the aircraft. Designers have since improved the BAK-12 to meet increased demands of heavier and faster aircraft. They retrofitted the energy absorbers with larger 66-inch or 72-inch tape storage reels to accommodate increased runout, thus increasing the total energy capacity of the system. Although some BAK-12 systems have 60-inch tape storage reels, new and upgraded BAK-12 systems have 66-inch reels. These systems require 366 meters (1,200 feet) plus the length of the aircraft for maximum runout. The 72-inch reel systems are special-purpose systems configured for 610 meters (2,000 feet) of runout.

The standard BAK-12 is configured for cross-runway separations of up to 61 meters (200 feet) (distance between fairlead beams or deck sheaves). For installations with cross-runway spans exceeding 61 meters (200 feet), replace the BAK-12 control valve cam to accommodate full runout of the system.

Dual BAK-12 systems are special-purpose installations configured to accommodate high-energy engagements of aircraft ranging from 27,200 to 63,500 kilograms (60,000 to 140,000 pounds). These configurations consist of 4 BAK-12 energy absorbers arranged in pairs on either side of the runway. The energy absorbers may be standard BAK-12s or be equipped with 72-inch diameter tape storage reels to accommodate 610 meters (2,000 feet) of runout. You need special tape connectors and edge sheaves for these installations.

14930-1.7        **BAK-13.** The BAK-13 is a bi-directional aircraft arresting system. It employs 2 velocity-sensitive energy absorbers installed on opposite sides of the runway, interconnected by nylon purchase tapes and a 32 millimeter (1.25 inch) disc-supported pendant. The energy absorbers are made from a steel weldment base that incorporates a tape-storage reel mounted on a vertical shaft and a vaned rotor assembly enclosed within a vaned stator assembly (also called a tub) that contains a water and glycol mixture. A rewind engine, transmission assembly, and an operator control panel are also included along with necessary hydraulic system components.

The energy imparted during an aircraft arrestment converts heat through the turbulence developed by rotation of the vaned rotor within the vaned stator. An external cooling reservoir permits rapid cycle of this system.

The site requirements are essentially the same as for the BAK-12; however, the low-profile units maybe located as close as 46 meters (150 feet) from the runway edge if installed in a semi-permanent configuration. These systems require 290 meters (950 feet) plus the length of the aircraft for maximum runout. *The BAK-13 is not currently in production as a system. I should not be considered as a suitable system for a new requirement due to the potentially high hook load generated during engagement.*

14930-1.8        **BAK-14 and Type H Hook cable Support Systems.** The BAK-14 hook cable system is a bi-directional hook cable (pendant) support system used in conjunction with the BAK-12, BAK-13, or a comparable arresting system to engage and safely stop a hook-equipped aircraft. It provides the means to support the pendant at least 2 inches above the runway surface while giving ATC the means to lower the pendant below the surface of the runway to prevent damage to low-undercarriage aircraft, the pendant, and the pavement below the pendant during trampling. These systems can accommodate 46, 60, and 90 meters (150, 200, and 300 foot)-wide runways, but you order the system to suit the specific application. The control side BAK-12 pit or protective shelter and foundation must be expanded to house the compressed air and control systems needed to operate this supplemental system.

The Type H hook cable support system is a bi-directional hook cable support system that can be used in conjunction with any type of energy-absorbing device. It provides a means to raise a cable at least 2 inches above a runway surface or lower it below the runway surface in less than 1.5 seconds. It can be supplied to accommodate runway widths of 46, 60, and 90 meters (150, 200, and 300 feet). A radio remote control system provides ATC the means to operate the system and to monitor its operational status. It mainly consists of Retraction Modules (from 14 to 18 depending on runway width) installed into pre-cast concrete blocks across the runway, and connected together by metallic rods, to form a rigid loop. This loop is actuated by an electro-hydraulic motor that is located in a concrete pit on one side of the runway.

14930-1.9        **BAK-15.** The BAK-15 aircraft arresting barrier consists of a pair of electro-hydraulically powered steel masts that provide support and remote-

controlled movement for a unidirectional nylon net barrier. The masts are installed on opposite sides of the runway overrun on concrete foundations. The ATC tower contains a remote control panel, which can be hard-wired but the most common is radio controlled.

The barrier must be augmented with an energy-absorbing device such as a ship's anchor chain, BAK-12, or Textile Brake. During an aircraft engagement, shear links in the net suspension straps separate by the force of the aircraft engaging the net. The net then envelops the aircraft and seats on the leading edge of the wings, transferring forward momentum of the aircraft to the energy-absorbing device.

You can complement the system with a standard disc-supported pendant to accommodate tail hook engagements through interconnect configuration hardware similar to that used for the MA-1A Modified. The hook cable interconnect kit is designated as the 62 NI (net interconnect).

14930-1.10     **Textile Brake.** This modular arresting system is primarily intended as an emergency backup system for standard operational systems. It is comprised of multiple modules arranged in equal numbers on both sides of the overrun that contain specially woven textile tearing straps to absorb the kinetic energy generated during an engagement. One end of each module is anchored to the ground and the other end is connected to a tensioned cable positioned across the runway. The system is available in a 2-stage unidirectional configuration (MB 60.9.9.C) or as a single stage bi-directional system (MB 100.10.C).

The advantages of the 2-stage system (MB 60.9.9.C) over the bi-directional system (MB 100.10.C) are higher system capacity and lower costs for reconfiguration after low energy engagements. The modules in a stage (breaking lines) are expended upon aircraft engagement and must be replaced; however, a life cycle analysis indicates system costs are approximately 50 percent of the life cycle cost for a BAK-12 installed in the overrun area of a runway due to the low number of engagements that occur there. These systems are designed for tail-hook equipped fighter aircraft, but can also be complemented with a net barrier such as the BAK-15 or a net/cable interconnect system. They may also be configured for expeditionary or temporary installations.

If the bi-directional version of the Textile Brake arresting system is installed on the operational runway surface due to a non-standard length overrun, the Arresting Gear Marker (AGM) signs should be blanked when viewed from the approach. This is because the system is a low energy capacity system (compared with BAK-12 or BAK-13), and is not intended for approach end engagements.

14930-1.11     **Mobile Aircraft Arresting System (MAAS).** The MAAS is essentially a BAK-12 aircraft arresting system mobilized through installation on a specially developed trailer. It is configured for a maximum aircraft runout of 302 meters (990 feet). This system was initially developed and tested to accommodate recovery of fighter aircraft returning to a battle-damaged airfield. Such cases require rapid deployment and installation, and may require that only the minimum essential

anchoring hardware be installed to accommodate the above scenario. When installed for this purpose, the MAAS is installed using a 19-stake anchoring scheme. This configuration is limited to unidirectional engagement capability with a maximum aircraft weight and speed of 18,144 kilograms (40,000 pounds) at 150 knots.

The MAAS can be upgraded to accommodate bi-directional engagements with the full capacity of a standard BAK-12 aircraft arresting system. This is accomplished by increasing the total number of cruciform stakes used to anchor the system from 19 to 31, extending the runout to 366 meters (1,200 feet), and synchronizing the system for higher brake pressure. The system may also be installed in a set-back configuration to accommodate wide body aircraft operations through use of a fairlead beam.

14930-1.12 **Soft-Ground Type Aircraft Arresting System.** The Engineered Material Arresting System (EMAS) is an FAA-approved soft-ground system normally used for civil airports to mitigate short safety areas (less than 305 meters (1,000 feet) long) at runway ends. The system is constructed of cellular foam concrete of specific strengths and thickness to decelerate an aircraft that overruns the runway through rolling resistance. The design for each system is aircraft specific, based upon the type of aircraft that will use the runway. It is intended for use where it is impractical to obtain the standard 305 meter (1,000 foot) safety area and other alternatives are not feasible. For purposes of design, the soft ground arrestor system can be considered fixed by function and frangible since it is designed to fail at a specific load; therefore, a soft ground system is not considered an obstruction to navigation. Soft ground systems are located beyond the end of the runway, centered on the extended runway centerline. They will usually begin at some distance from the end of the runway to avoid damage due to jet blast or short landings. This distance will vary depending on the available area and the specific system design.

**149 45 MISSILE LAUNCH FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

14945-1 **DEFINITION.** This Category Code is provided for inventory purposes of missile and drone launch pads. See NAVSEA OP-5 for Explosive Safety Siting criteria of energetic liquids associated with launch pads.

**149 50 BLAST DEFLECTOR FENCE (EA)**

**FAC: 1464**

**BFR Required: N**

**Design Criteria:** None Available

14950-1 **DEFINITION.** Blast deflector fences are structures that direct the exhaust from jet engines upward. They are used in congested areas and parking and maintenance areas to protect personnel, equipment, structures, aircraft, and other



vehicles from the blast effect of jet engine exhaust. Blast fences are also used to prevent erosion of paved and unpaved areas and to provide protection from flying debris. Their siting and length must be based on the study of individual station requirements. Blast deflector fences may be purchased or constructed in sections to permit moving them from one position to another as protection requirements change. Careful selection of location is necessary to prevent creating an obstacle to taxiing aircraft.

## **149 62 TACTICAL VEHICLE WASH FACILITY (SF)**

**FAC: 1496**

**BFR Required: Y**

14962-1 **DEFINITION.** A wash structure located to support maneuver/training areas and provide prewash mud removal and washing of military vehicles. Structure typically provides water-soaking capability for tactical tracked and wheeled vehicles, high and low pressure cleaning capability, water cannons, wash water containment and drains, sediment basins, and sludge removal. Prep and prewash areas, wash stations, water treatment, water supply, basins and controls/equipment are included as components of the facility. The facility that houses the controls/equipment is captured under CCN 89009 Miscellaneous Utility Building.

14962-2 **REQUIREMENTS.** Sizing requires an engineering analysis on a case-by-case basis. No criteria is available for this category code.

## **149 85 EXPEDITIONARY AIR CONTROL SITE – MACS AND MASS (EA)**

**FAC: 1467**

**BFR Required: Y**

**Design Criteria:** UFC 4-141-10N, Aviation Operation and Support Facilities

14985-1 **DEFINITION.** These are Marine Corps facilities required to accommodate, in-garrison, the equipment used for expeditionary aircraft command and control. These facilities are assigned to specialized Marine Corps squadrons, and the expeditionary equipment used in conjunction with these facilities is normally squadron property. The Marine Air Control Squadron (MACS) and the Marine Air Support Squadron (MASS) are squadrons within the Marine Air Control Group (MACG) and Marine Aircraft Wing (MAW) that are directly responsible for air defense and air control. Each MACS contains two Air Traffic Control (ATC) Detachments and one Air Defense Detachment. The ATC Detachments were formerly the Marine Air Traffic Control Unit (MATCU). Both the MACS and MASS are squadrons in the MAW and are directly responsible for air defense and air control.

**149 86 OPERATIONS SUPPORT SHED (EA)**  
**FAC: 1499**  
**BFR Required: Y**

14986-1 No criteria currently exist for this category code.

## **151 PIER FACILITIES**

**151-1 DEFINITION.** A pier is a structure that extends out from shore into navigable water and is designed for the homeport or temporary berthing of vessels. Services available at pier side include, but are not limited to, ship repair, fueling, training and other essential services, such as potable water, electric power, compressed air, waste disposal and communications facilities. A pier is oriented either perpendicular to or at an angle with the shore and normally accommodates berthing on both sides for its entire length although there are instances where only one side is used because of site conditions or because there is no need for additional berthing space. Code 151 includes all piers regardless of function served, protective dolphins at pier heads, fendering systems, and mooring fixtures, original dredging performed specifically for the purpose of providing the pier facility, all trackage on the pier, and all supporting utilities and services.

Piers provide a transfer point for cargoes and/or passengers between water carriers and land transport. Separate facilities should be maintained where service involves large volumes of both cargo and passengers. Joint service use of piers should be considered when at all possible.

In countries outside the United States, a pier is often referred to as a jetty, or a mole when of solid fill construction, and a wharf is referred to as a quay or a jetty. In the United States, the term jetty refers to a solid fill structure, located on an open seacoast at the mouth of a river or tidal inlet, designed to prevent shoaling of a channel by littoral materials and to direct and confine stream or tidal flow.

For data on channel and turning basin dredging, see UFC 4-150-06, Military Harborts and Coastal Facilities. For utilities and services landward of the inboard end of the pier, see UFC 4-150-02, Dockside Utilities for Ship Service. For crane and railroad trackage on shore, see Civil Engineering and Utilities, MIL-HDBK-1005/6. For transit sheds on piers, see category code 156 10; and for fixed crane structures, see category code 213 40.

Piers are classified according to their primary function and are described under their respective category codes.

**151-2 BERTHING.** Piers are used to provide either multipurpose berths or special purpose berths. Piers providing multipurpose berthing are used to service several classes of vessels so that ships will have the option of utilizing any one of several berthing facilities at a port. Berth selection depends upon the need to match available

space, utilities and support services with the requirements of an incoming ship. It is not economically feasible to develop a single facility to accommodate and service all classes of vessels. Special berths are provided when berthing arrangements and/or locations are required for fueling vessels, berthing vessels carrying explosives, and for repairing vessels.

**151-3 FEATURES.** The following list gives appurtenances and facilities generally provided at or near piers. The facilities to be provided depend on functional requirements, which often determine the classification of the pier. The location of support facilities will be dependent upon the existence of weapons handling Explosive Safety Quantity Distance (ESQD) Arcs.

Located on the pier:

1. Berths having sufficient depths and widths to allow for efficient servicing of ship and safe vessel approach and departure.
2. Sufficient mooring devices (bollards, bitts, cleats) to safely secure vessel.
3. Hotel and ship service facilities.
4. Fender systems, oil containment booms and floating/fixed AT/FP barriers
5. Camels or struts.
6. Brows and stands for ship access to the pier
7. Access facilities for railroad cars, trucks and emergency vehicles.
8. Cranes and trackage.
9. Privately Owned Vehicle (POV) parking

Provided by the host activity in the general area of the pier:

1. Cargo handling equipment.
2. Firefighting equipment.
3. Covered and open storage space for cargoes; fenced where required, for control of pilferage.
4. Office space.
5. Sanitary facilities.
6. Ship support and repair facilities.

## 7. Medical facilities.

**151-4 LOCATION AND ALIGNMENT.** The location and alignment of piers in a harbor should consider factors such as ease of entering and leaving berth, required quayage, harbor line restrictions, adjacent navigational channels, foundation conditions and isolation requirements. For further information and criteria, see Military Harbors and Coastal Facilities, UFC 4-150-06.

**151-5 PIER DIMENSIONS AND CLEARANCES.** The dimensions of a pier are based primarily on the lengths of the vessels, present or contemplated, that it is to accommodate. The length of the pier is dependent upon the type of ship, and the width is dependent upon the type of service to be provided. Pier measurements and allowances for single-length and multiple-length berths are based upon either accommodating known vessels or known types of vessels, where types but not specific ships are known. The dimensions for both types are determined as follows:

### 1. Pier Length.

- a. Single-Length Berth shall equal the overall length of the largest vessel to be accommodated, plus an allowance of 50 feet at each end of the vessel. For aircraft carriers, the allowance at each end of the vessel is 100 feet. See Figure 151-10 for berthing diagram. Reference the following ship characteristics data in UFC 4-152-01 Piers and Wharves as follows:

Table 2-1 Ship Characteristics for Selected Ships (Fully Loaded)

Table 2-2 Ship Characteristics for Selected Ships (Lightly Loaded)

- b. Multiple-Length Berths shall equal the total overall length of the largest vessels simultaneously accommodated, plus allowances of 100 feet between vessels, 50 feet between the shore and the inshore ship and 50 feet beyond outermost moored vessels. See Figure 151-10 for berthing diagram.

2. **Pier and Wharf Width.** The width of a pier or wharf is determined on the basis of functional requirements, space availability and site conditions such as water depths, subsurface conditions and clearances. The widths of piers and wharves, as discussed hereinafter, refer to the dimensions determined for specific function classifications. These dimensions should not be less than the widths determined by geotechnical and structural considerations. Factors to be considered in the determination of pier and wharf widths are as follows:

- Berths Provided on Outboard Face of Pier. Because pier widths are determined on the basis of the requirements of the main berths, the outboard face, or the end of a pier may be used only for vessels whose overall length does not exceed the width of pier and where bow and stern clearances conform to established criteria. The proximity to

shipping lanes and high-energy wave environments may prohibit the use of this portion of the pier.

- Berths Provided Alongside Pier or Wharf. Total structure width depends upon the size of the transit shed, if any, type of crane service provided, number of railroad tracks, firefighting equipment and truck lanes furnished and requirements for work space and open storage areas. At wharf facilities, open storage areas are often contiguous to the apron and shed, but at pier facilities open storage areas are generally located off the pier and thus do not affect the determination of total pier width. Table 15111-1, indicating minimum pier widths, is furnished as a guide.
- Berths for Carriers. Camels specifically designed to breast off aircraft carriers should be provided at designated carrier berths. Alternatively, the provision of additional pier width may be considered to provide clearances for overhangs of flight decks and elevators.
- Services Requiring Additional Width. Adequate width should be provided to accommodate railroad tracks, truck lanes, crane ways, emergency response equipment and fuel handling equipment when furnished.

### 3. Slip width.

- General Considerations. The clear distance between piers, or slip width, should be adequate to permit the safe docking and undocking of the maximum size vessels that are to be accommodated in the slip. The size of slip should also permit the safe maneuvering and working of tugboats, barges, lighters and floating cranes. At multiple berth piers, where vessels are docked either one per berth, two abreast per berth, sufficient clearance should be available to permit the docking and undocking of vessels at the inshore berth without interfering with vessels at the offshore berth. Because the size of a slip is affected by docking and undocking maneuvers, consideration should be given to the advice of local pilots who are familiar with the ships to be handled and with prevailing environmental conditions such as winds, waves, swells and currents. The slip width should be reviewed with specific functional requirements of the individual installation before a final determination is made.
- Minimum Width of Slip for Active Berthing. Minimum widths should be as shown on Figure 151-10. Widths are defined as a factor times the beam of the largest vessel to be accommodated. The minimum width should not be less than 300 feet. The recommended criteria are applicable only if vessels are turned outside the slip area.

Reference the following ship characteristics data in UFC 4-152-01 Piers and Wharves for the beam of typical vessel types as follows:

Table 2-1 Ship Characteristics for Selected Ships (Fully Loaded)

Table 2-2 Ship Characteristics for Selected Ships (Lightly Loaded)

At submarine slips, width requirements should be increased by at least four vessels beam and more, as required, to account for camels and separators, to provide for ships' vulnerability if their safety is involved, to provide for special maneuvering requirements of other ships during berthing or passing and to provide for special environmental conditions such as currents, waves and winds.

- The requirements discussed above apply where vessels are berthed on both sides of a slip. Where vessels are berthed on only one side of a slip, the width may be reduced.
- Referring to Figure 151-10, when more than 2 abreast berthing is employed, the width of slip should be increased by one ship beam for each additional ship added in order to maintain adequate clearances between moored ships during berthing and un-berthing maneuvers. Thus, for 2 abreast berthing on both sides of a slip, the slip width for single berth piers would be equal to 8 times ship beam and the slip width for multiple berth piers would be equal to 9 times ship beam.
- Minimum Width of Slip for Active Berthing. At slips containing inactive berths where vessels are stored for long periods of time on inactive status, in nests of two, three or more, clear distances between moored vessels and slip width may be reduced by one or two vessels beam to reflect the reduction in the frequency of berthing maneuvers and the decrease in activities of small boats and floating equipment.

#### 4. Water Depth in Slips.

Minimum Depth of Water. In a sheltered harbor and where the harbor bottom consists of soft material, water depth in a slip, measured from Mean Lower Low Water (MLLW) should be equal to the maximum loaded draft of the vessels to be accommodated plus a minimum clearance of 4 feet which includes an allowance of 1 foot for vessel trim in loading, 2 feet for under keel clearance and an allowance of 1 foot for tidal variations. For the loaded draft of typical vessel types, refer to UFC 4-152-01 Piers and Wharves as follows:

Table 2-1 Ship Characteristics for Selected Ships (Fully Loaded)

Table 2-2 Ship Characteristics for Selected Ships (Lightly Loaded)

Additional information is available in UFC 4-150-06 Military Harbors and Coastal Facilities at <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-4-150-06>. Specified water depths should be maintained as close to the fender line of the structure as is practicable considering the accessibility of dredging equipment used during maintenance dredging operations.

a. Other Considerations. Minimum keel clearance of 4 feet should be increased if any of the following conditions prevail:

- Harbor bottom consists of a hard material such as rock.
- Excessive silting (one foot per year or more) occurs.
- Slip area is exposed to waves, swells and winds.
- Extreme low water (one foot or more) occurs.
- Investigation indicates probable fouling of condensers.

Aircraft carriers have had situations where they suck up bottom sediments and marine organisms through their intakes, clog up condenser coils and cause undue wear on machinery. In model tests it has been determined that one part of the solution to these situations is to increase the depth below the keel. Therefore, the water depth at carrier berths and anchorages shall be 50 ft. from MLLW datum for new construction. Water depth at existing facilities shall be increased to 50 ft. where feasible. Depths for AOE's may be increased for similar reasons. However, special studies at specific locations are required.

For Vessel Characteristics, refer to UFC 4-152-01 Piers and Wharves as follows:

Table 2-1 Ship Characteristics for Selected Ships (Fully Loaded)  
Table 2-2 Ship Characteristics for Selected Ships (Lightly Loaded)

These tables provide a comprehensive listing of pertinent data for vessels in the naval fleet. The following is a list of footnotes which applies to the tables:

- Ordinarily, extreme breadth is the maximum width of vessel. For submarines, the value given is the maximum diameter or width of the hull structure and is not necessarily the maximum width which may occur at the horizontal stabilizer planes and is so noted. Canted aircraft carrier flight decks may not be dimensionally symmetrical about the longitudinal centerline of the vessel, marking the extreme breadth value for aircraft carriers unsuitable for determining berthing camel width at piers and wharves with gantry crane service.
- Maximum navigational draft is the minimum depth of water required to prevent grounding of a vessel due to appendages projecting below the vessel's base line or keel. Such appendages may be sonar domes, propellers, rudders, hydrofoils, vertical submarine control planes, etc. Many vessels also possess a decided trim to the bow or stern in fully loaded condition or in the case of submarines, a trim to the stern in surfaced condition.

- Water depth at carrier berths and anchorages is 50 ft. from MLLW datum for new construction. Water depth at existing facilities will be increased to 50 ft. where feasible. Depths for AOE's may also be increased if justified.

**Table 15111-1  
Typical Pier and Wharf Widths**

Function Classification	Vessel Type	Minimum Pier Width (feet)	Minimum Wharf Apron Width (feet)	Railroad Tracks (standard gage)	Rail-Mounted Cranes
1. Ammunition	Ammunition	100	100	-	-
2. Berthing	Aircraft Carrier	100	-	-	-
3. Berthing	Cruiser	80	-	-	-
	Destroyer	80	-	-	-
	Frigate	80	-	-	-
	Submarine	60	-	-	-
	Auxiliary	80	-	-	-
4. Fitting-out	Destroyer	100	-	2 tracks; 1 each side	2-30 ft. Gage; 1 each side
5. Repair	Cruiser	125	-	4 tracks; 2 each side	2-30 ft. Gage; 1 each side
	Auxiliary	125	-	4 tracks; 2 each side	2-30 ft. Gage; 1 each side
6. Fueling	Auxiliary	50	-	-	-
7. Supply (General Cargo)	Auxiliary	125 plus shed width	60	2 tracks	-
8. Supply (Container Cargo)	Auxiliary	80	80	Up to 3 tracks	1 50 ft. Gage



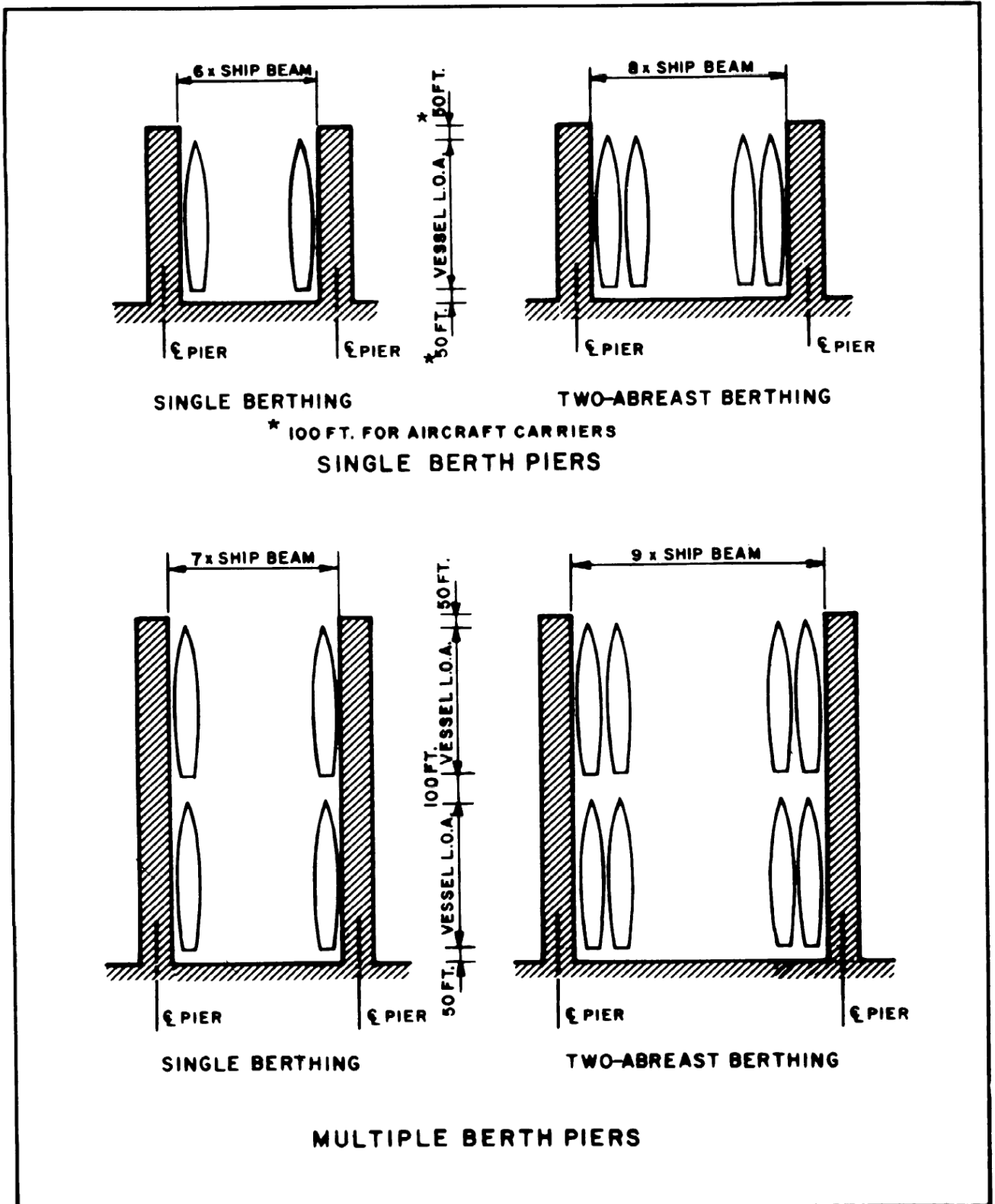


FIGURE 151-10  
Slip Widths

**151 10 AMMUNITION PIER (FB)****FAC: 1511****BFR Required: Y**

**15110-1 DEFINITION.** Ammunition piers are designed for use in the receipt of ammunition for storage and for the offloading of ammunition onto barges and ships. In some cases outgoing ammunition is first loaded from the ammunition pier onto barges for transfer to ships moored offshore or in a roadstead. The services and facilities provided for ammunition piers include lighting, telephone and fire alarm systems, and salt water for firefighting. Railroad tracks are normally provided unless the established method of handling ammunition is by truck. Freshwater is provided if a supply is readily available. For dimensional and other pertinent information, see Code 151. For quantity-distant standards for pier and wharf facilities handling explosives and ammunition, see NAVSEA OP-5, Volume 1. This pier is for break bulk load/off-load of ammunition. For containerized load/off-load of ammunition, use Category Code 151 70, Ordnance Container Handling Pier.

**151 20 GENERAL PURPOSE BERTHING PIER (FB)****FAC: 1511****BFR Required: Y**

**Design criteria: see Piers and Wharves, UFC 4-150-01**

**15120-1 DEFINITION.** General Purpose Berthing Piers are used primarily for mooring home ported and transient ships that do not require piers equipped with shipyard facilities. Berthing piers are classified as active or inactive. The active berthing piers are used when ships are berthed for a relatively short time; the inactive classes are used when ships are to be tied up for long periods in a decommissioned status.

When berthing for carriers is to be provided on one side only or on both sides of a berthing pier the width of the structure shall be adequate to provide clearance for the overhang of the flight decks and sponsors. Alternatively, camels or other separators may be provided to fend off carriers.

All piers regardless of their function, will include such appurtenances as protective dolphins, fender systems, and dredging in connection with the facility. Supporting utilities, crane/railroad trackage, fixed cranes, and transit sheds on piers will carry their appropriate category codes. For other pertinent information, see Code 151 (general notes).

**151 40 FUELING PIER (FB)****FAC: 1511****BFR Required: Y****Design criteria: see Piers and Wharves, UFC 4-150-01**

**15140-1 DEFINITION.** Facilities for berthing ships while discharging fuel to storage or receiving fuel from storage are provided at fueling piers. Such piers will provide salt water for firefighting, telephone and fire alarm facilities and may provide freshwater, steam in cold climates, electric power. In addition, a fuel main and special protective hose racks and small derricks for handling fuel hoses are necessary. They shall also be equipped with pipelines for each type of fuel to be stored at the site, including bilge and ballast lines. Stripper pumps for emptying lines are also necessary. A fueling pier may be justified for those stations where bulk quantities of liquid fuel can be economically handled by water transportation. These piers vary according to the service required, the local exposure to wind and water, and the geologic formation of the site.

For dimensional and other pertinent information, see Code 151.

**151 50 REPAIR PIER (FB)****FAC: 1511****BFR Required: Y****Design criteria: see Piers and Wharves, UFC 4-150-01**

**15150-1 DEFINITION.** Repair piers are constructed and equipped to permit overhaul of those portions of a vessel above the waterline. These structures will normally be equipped with a gantry crane and standard-gage railroad tracks and have facilities to provide salt and freshwater, steam, compressed air, telephone and fire alarm service, and electric power for ship service, lighting and welding. In some cases industrial gases may be provided.

For dimensional and other pertinent information see Code 151.

**151 60 SUPPLY PIER (FB)****FAC: 1511****BFR Required: Y****Design criteria: see Piers and Wharves, UFC 4-150-01; Supply Facilities, UFC 4-442-01N and MIL-HDBK 1032/2.**

**15160-1 DEFINITION.** Supply piers accommodate berthing for the transfer of materials between ship and shore. A large building or transit shed normally occupies the central portion of a supply pier. The pier width will be in direct ratio to the width of the shed or sheds, placed longitudinally down the center of the pier. For example, the shed for a ship needing 600 feet of berthing space is 150 feet wide. Transit sheds are normally placed side by side parallel with the long axis of the pier when both sides of a

pier are used for shipments. The pier width should then be from 380 to 420 feet because the pier deck or apron should be from 40 to 60 feet wide to accommodate railroad track, dock truck trains and allow proper cargo handling. Space restrictions at some seacoast installations will undoubtedly dictate the construction of piers of lesser width. In such cases, transit sheds must be designed with these restrictions. Planning for supply piers at installations will usually be restricted to industrial seaport locations having a primary stock point mission. For dimensional and other pertinent information relative to supply piers other than that in the preceding paragraph, see Code 151.

### **151 70 ORDNANCE CONTAINER HANDLING PIER (FB)**

**FAC: 1511**

**BFR Required: Y**

**15170-1 DEFINITION.** An ordnance container handling pier is used primarily for the offloading and receiving of explosive ordnance in containers from non-self-sustaining container ships. This does not preclude use of the pier by conventional break-bulk or self-sustaining container ships. The pier should be sited in accordance with NAVSEA OP-5, Volume I. The services and facilities provided on the pier are lighting, telephones, fire alarms, and salt water for firefighting. Railroad tracks are provided where the normal method of drilling containers to the pier is by Trailer on Flat Car or Container on Flat Car (TOFC/COFC). Rails are flush with pier deck surface for ease of operations when moving containers by trucks on the pier.

For dimensional and other pertinent data, see Category Code 151Series (general notes) and UFC 4-150-01 Piers and Wharves.

### **151 71 DEGAUSSING PIER (FB)**

**FAC: 1511**

**BFR Required: Y**

**15171-1 DEFINITION.** Sizing for this Category Code is based on the type of vessels to be serviced and is driven by the NAVSEA specified equipment. Special studies are required on a case by case basis.

### **151 80 DEPERMING PIER (FB)**

**FAC: 1511**

**BFR Required: Y**

**15180-1 DEFINITION.** Sizing for this Category Code is based on the type of vessels to be serviced and is driven by the NAVSEA specified equipment. Special studies are required on a case by case basis.

**151 90 ACCESS TRESTLE TO PIERS AND WHARVES (SF)**  
**FAC: 1513**  
**BFR Required: Y**

No criterion currently exists for this category code.

## **152 WHARVES**

**152-1 GENERAL.** A wharf is an open type marginal structure for the berthing of vessels; it is usually connected to the shore at more than one point. In most cases it will accommodate berthing along the outer face only, although a portion of the inner face may provide berthing space at a shallower draft. A wharf does not necessarily have continuous access to the shore. In general, the planning criteria that apply to piers are also applicable to wharves. Either may serve the same practicable purpose, however, since their physical design and layout will be much different, their capacities for berthing and cargo handling will vary. Piers are generally preferable structures; however, certain locations will dictate the use of a wharf rather than a pier because of the marginal fairway and topography involved.

For general planning information pertinent to wharves listed under Category Code 152 10 through Code 152 80, see the same pier designation listed under Category Code 151 10 through 151 80. The corresponding category codes for wharves are as follows:

**152 10 AMMUNITION WHARF (FB)**  
**152 20 GENERAL PURPOSE/BERTHING WHARF (FB)**  
**152 30 FITTING OUT WHARF (FB)**  
**152 40 FUELING WHARF (FB)**  
**152 50 REPAIR WHARF (FB)**  
**152 60 SUPPLY WHARF (FB)**  
**152 70 ORDNANCE CONTAINER HANDLING WHARF (FB)**  
**152 71 DEGAUSSING WHARF (FB)**  
**152 80 DEPERMING WHARF (FB)**

## **153 CARGO HANDLING OR STAGING AREAS**

**153 10 CARGO STAGING AREA (SY)**  
**FAC: 8526**  
**BFR Required: Y**

15310-1 DESCRIPTION. A cargo staging area is an open hardstand for temporary storage of cargo awaiting further transshipment. For Open Storage, approximately 30,000 square feet of open storage area is required for each 431 short tons, or 385 long tons, or 1,000 measurement tons of cargo on hand per month based on a conversion

factor of 2.32 measurement tons per short ton. For conversion factors for different commodities see page TBD. Average stacking height should be six feet. The square footage requirement should be established at 10% more than the space needed at peak times unless there is a wide discrepancy between the average amount of cargo on hand per month and the largest amount of cargo on hand at any one month during the last year. The square footage requirement should be established at 15% more than the average space needed in peak times if the discrepancy is recurring in nature. Average amount of receipts compared to issues per month as well as average hold time of cargo per month may be useful in developing data to support the facility requirement.

## 154 SEAWALLS, BULKHEADS, QUAYWALLS

154-1 **GENERAL.** Seawalls, bulkheads, and quay walls are shore protective structures not intended primarily for berthing vessels. Bulkheads and quay walls have the principal advantage of affording accessibility for their entire length along the foreshore. In addition, a much greater working area normally is available at each berth for storage, laydown, and repair operations than at berths alongside piers and wharves. The ratio of berthing space to a given length of waterfront, however, is much less for bulkheads and quay walls. The relative cost per berth is much greater for quay walls, especially for those in deep water or at sites with poor foundation conditions. Maneuverability into a berth at a long quay wall occupied by ships in adjoining berths is more difficult than entry into a single-length pier berth. In spite of these drawbacks, a quay wall may prove to be the only choice at a site located along a river or other relatively narrow channels if the natural terrain is high along the shore, making dredging of a recessed basin for piers very expensive, or if there is insufficient width of waterway for safe navigation into finger piers projecting out at an angle from the natural shoreline.

### 154 10 SHALLOW WATER BULKHEAD AND QUAYWALL WITHOUT A RELIEVING PLATFORM (LF)

**FAC: 1541**

**BFR Required: N**

15410-1 **DESCRIPTION.** This type of bulkhead or quay wall is a structure to retain earth along a shoreline in shallow water. The depth of water is typically limited to a 25 feet and the structure has no relieving platform. This structure does not provide ship berthing (151 Piers and 152 Wharves should be used for any ship berthing requirement). Typically these structures are found between piers or wharves and are often used for Small Craft Berthing. It should be noted that this is a functional definition independent of the design type. Using today's technology bulkheads and quay walls have many useful design alternatives and the most economical construction should dictate the design based on local conditions.

15410-2 The linear footage and type of bulkhead required at any one installation would be determined by site location, the availability of real estate, topography, currents and wave action.

**154 20 DEEP WATER BULKHEAD AND QUAYWALL WITH A RELIEVING PLATFORM (LF)****FAC: 1512****BFR Required: Y**

15420-1 **DESCRIPTION.** This type of bulkhead or quay wall is a structure to retain earth along a shoreline in deep water. Typically with a water depth exceeding 25 feet and includes a relieving platform to support heavy logistics operations. This structure does not provide ship berthing (151 Piers and 152 Wharves should be used for any ship berthing requirement). Typically these structures are found between piers or wharves and are often used for Small Craft Berthing. Using today's technology bulkheads and quaywalls have many useful design alternatives and the most economical construction should dictate the design based on local conditions.

15420-2 The linear footage and type of bulkhead required at any one installation would be determined by site location, the availability of real estate, topography, currents and wave action.

**154 30 SEAWALLS AND RIP RAP (LF)****FAC: 1541****BFR Required: N**

15430-1 **DESCRIPTION.** These are structures built along and parallel to a shoreline (river or coast line) protecting and stabilizing the shore against erosion resulting from wave and current action. This is a functional definition and various types of construction can be used to support this function. The most economical and efficient structure for a particular location can be determined only after a thorough study of local hydrographic and meteorological conditions, the amount and type of protection desired, and the characteristics of the property to be protected. This type of structure is often used in conjunction with a Category Code 871 35 Retaining Wall.

**155 SMALL CRAFT BERTHING**

This basic category group provides facilities supporting small craft operations. Included in this category are, but not limited to, yard craft, tug boats, security and service craft.

**155 10 FLEET LANDING (FB)****FAC: 1551****BFR Required: Y**

15510-1 **DESCRIPTION.** A fleet landing is a fixed or floating pier designed for the loading and/or unloading of a ship's personnel onto or from a personnel boat or ferry.

This facility must be in quiet water, carefully sheltered against disturbances. Water depth must be adequate for the type of ferry or service craft used. Requirements are developed based on the site specific conditions including tide range, available real estate and the types of crafts that will be using the facility. Category Code 155 20 can be used for general guidelines.

### **155 11 FLEET LANDING BUILDING (SF)**

**FAC: 1552**

**BFR Required: Y**

15511-1 **DESCRIPTION.** A fleet landing building is a structure used to accommodate ship's personnel being loaded or unloaded from a personnel boat or ferry. The size and type of structure is dependent upon the average number of personnel being transferred at any one time and the type of climate in which the structure is located. In the absence of specific criteria, the quantitative requirements for the facility should be determined on an individual basis based on the experience and knowledge of the activity involved and the appropriate Systems Commands. Category Codes 155 21 and 159 64 can be used for general guidelines.

### **155 20 SMALL CRAFT BERTHING (FB)**

**FAC: 1551**

**BFR Required: Y**

15520-1 **DESCRIPTION.** Berthing plans at waterfront facilities will provide space for all small craft authorized by CNO/CMC. Access and maintenance mooring arrangements should include facilities for harbor and pilot launches, survey boats, work boats, special service craft, rescue boats, and other small craft. If necessary, breakwaters will be provided for shelter against wind and wave action. Small boat piers and boathouses may be planned if several craft of medium and large size are to be accommodated. For medium and larger craft, water depth must be a minimum of 6 feet and preferably 8 feet at mean lower low water (MLLW). The pier may be designed to handle vehicles and provide turning space at the ell end of the pier. Water and electricity are required, as well as boat-fueling dispensers appropriately located on the pier. The utility services (800 series) and fueling for small craft (Category Code 122 30) are provided as secondary code items.

15520-2 **REQUIREMENT.** The requirement for Small Craft Berthing can be calculated using the following algorithm:

The following information should be obtained from Port Ops: CNO and other Small Craft loading, small craft dimensions, and the end-to-end spacing per type of small craft. If the end-to-end spacing varies between small craft types, then use the average spacing.

With the aforementioned information, the feet of berthing (FB) or meters of berthing (MB) necessary can be calculated using:



[Number of each type of craft x length (or width depending on orientation of the crafts)] + [end-to-end spacing required x total number of crafts]

In addition to the FB/MB necessary there are secondary factors to consider:

- Draft - Medium and large craft = minimum of 6 ft (1.83 m), preferably 8 ft (2.44 m) at mean lower low water (MLLW)
- Breakwater required (yes/no)?
  - If yes, then determine the required length (see Category Code 16410)
- Boathouse required (yes/no)?
  - If yes, then see Category Code 155 21
- Vehicle access required (yes/no)?
  - If yes, add FB/MB depending on the vehicle type
- Vehicle turning space required (yes/no)?
  - If yes, add FB/MB depending on the vehicle type

**155 21 SMALL CRAFT BOATHOUSE (SF)**

**FAC: 1552**

**BFR Required: Y**

15521-1 **DESCRIPTION.** A boathouse is necessary where an alert crew is required, where a boat facility is remote from the supporting activity, or where boat repair facilities are essential. Boat crew quarters or a boathouse may be programmed for those locations that justify an alert crew for the aviation rescue boats, where the boat facility is remotely located from the supporting facility, and where boat repair facilities (either Code 213 56 or 213 58 as appropriate) are required. The boathouse is programmed on the following basis:

Alert crew quarters	85 square feet per person
Office and shop space	85 square feet per person
	<hr style="width: 50%; margin: 0 auto;"/> 170 square feet per person (Includes toilet and custodial space)

A boat shelter is often included as part of this facility and is sized by a study of the vessels required to meet the specific mission.

The following facilities should be provided for: repair shops and working platforms, crew bunkhouse, toilets, mechanical equipment room, a small office, boat machine and carpenter shops, marine railway hoist or crane, covered storage, paint shop, battery shop, fuel storage tanks with pumping apparatus, water, electricity, and sail loft, if necessary. At mean lower low water (MLLW), the depths in a boathouse shall not be less than 5 to 6 feet. The ceiling clearances shall conform to the requirements of the various craft accommodated, but they should not be less than 16 feet. Working platforms should be about 3 feet above mean higher high (MHHW) water. A boathouse roof should provide cover over walkways and berths for emergency craft.

**155 22 SMALL CRAFT BOAT RAMP FACILITY (EA)****FAC: 1591****BFR Required: Y**

15522-1 **GENERAL.** Both the Navy and Marine Corps have in-shore boat teams that patrol inland waterways in support of various missions such as providing military escorts; securing inland waterways; carrying out “presence patrols”, and performing peacekeeping missions. These “brown water” functions require the use of fast boats that can be launched in shallow water and are capable of negotiating inland waterways. These capabilities require shore facilities such as boat ramps and piers or bulk heads that allow for launch and retrieval of these boats from towable trailers. This category code should be used for both home-ported and forward deployed operational or security forces requiring small boat launch ramps for the purposes of conducting in-shore training maneuvers or security patrols.

15522-2 **DEFINITION.** Small Craft Boat Ramp Facilities will provide a finished boat ramp that allows for launching operational boats from trailers and will be sloped to allow for proper approach, launch, and retrieval of the tow vehicle and boat/ trailer combination. This facility also includes an associated launch pier (per lane), parking (secure, if needed), and any bulkhead or shoreline erosion control measures (i.e., riprap or quarry rock) deemed necessary. Where mission requirements dictate, the launch pier should be based on criteria under Small Craft Berthing, CCN 15520 and captured in iNFADS as a sub category on the ramp Property Record Card (PRC).

The parking areas and approach apron are constructed of concrete or asphalt and are required for all Small Craft Boat Ramp facilities. These areas should be sized according to the criteria for Operational Vehicle Parking, CCN 14312 and shown as a separate utilization on the Boat Ramp property record card. All areas of the ramp, associated parking, and maneuvering areas must include adequate site lighting to allow for night time operations. In some cases, these areas might also be required to be secured via fencing and access gates. The boat ramp final design is based on many factors but for initial planning purposes, these guidelines and Figure 15522-1 dictate the parameters for a single lane small craft boat ramp facility. Note: this CCN provides requirements for a single lane ramp and uses a unit of measure of “EA”. Where ramps are required to be more than one lane, increase the quantity on the property record card based on the number of lanes needed. For example, a four lane boat ramp facility will have a quantity of “4” on the associated property record card.

15522-3 **PLANNING CRITERIA.** Small Craft Boat Ramp Facilities should be coordinated for use with the various training and operational schedules of different tenant commands at an installation. Tenant commands requiring boat ramp facilities should work together to determine how many lanes are necessary based on the optempo of their training cycles. The information included here should be used as a guide for planning operational boat ramps and their support spaces but further detailed information can be found in the UFC 4-152-07 Design: Small Craft Berthing Facilities.

15522-4 **BOAT RAMP/LAUNCH PIER REQUIREMENTS (refer to Figure 15522-1)**

**General guidelines:**

1. Ramps will be planned at 20' wide (clear width) and be constructed of reinforced concrete. The concrete surface will be grooved to provide both traction and proper drainage. Ramp slope will typically be set at 8 degrees (approximately 14%) wherever possible. Overall ramp length will be predicated on the local site grade elevation with respect to the Mean Lower Low Water (MLLW) mark.
2. The launch pier can be either fixed or floating but must maintain a clear minimum width of 6'. Pier length from the MLLW will be 50' minimum.

**Section (A) Approach:**

1. Ramp approach transition from the shoreline to the ramp must be gradual to accommodate long prime-mover and trailer combinations. If the adjacent site terrain is relatively flat and does not have a natural slope towards the ramp, the approach apron must be vertically curved approximately 20' from the parking/circulation area elevation to the boat ramp (see Fig. 15522-1). This area is accounted for in the parking allowances determined under the associated Operational Vehicle Parking/Laydown Area CCN 14312.
2. Any pedestrian ramps along the pier length will have a max slope (up or down) of 4 degrees (approximately 7%) to transition between various tide levels.

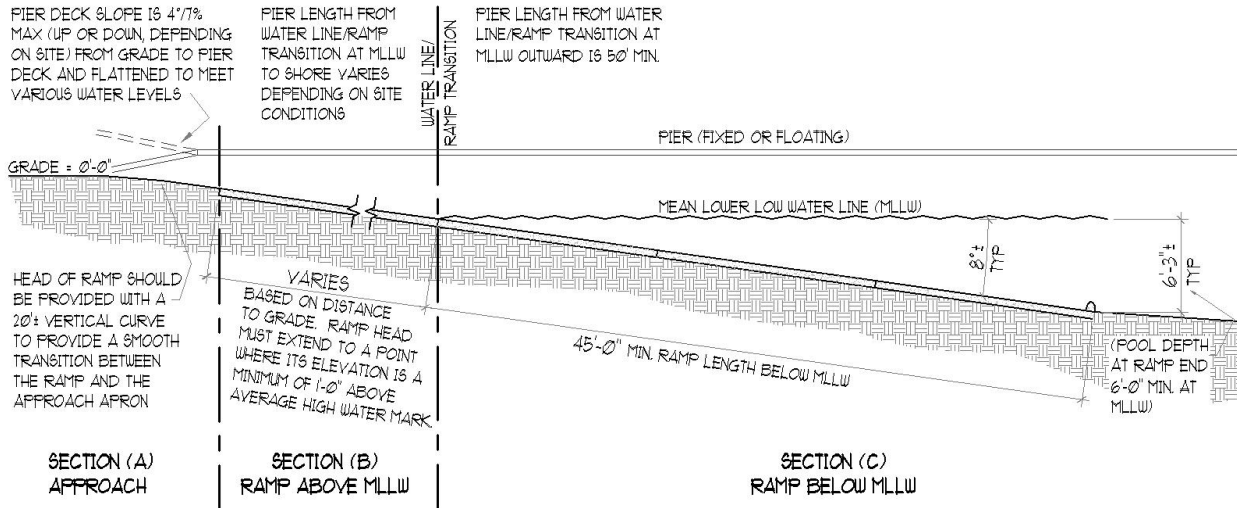
**Section (B) Ramp Above MLLW:**

1. Ramp length from the water line/ramp transition at MLLW is based on the shore elevation above the MLLW (see Figure 15522-1.) This distance must be determined in the field.
2. Pier length from the water line/ramp transition at MLLW is also based on the shore elevation above the MLLW. Note that the pier deck can be sloped up to 4 degrees (up or down) at any point along its length to shorten the required distance between the pier and shoreline. This determination will be made in the field.

**Section (C) Ramp Below MLLW:**

1. Ramp length below the MLLW is approximately 45'. At the designated 8 degree slope, this provides for a 6' deep pool at the foot of the ramp. The pool must be a minimum of 6' below the MLLW in all cases.
2. The pier length is not to exceed 75' in length from the water line/ramp transition at MLLW out into the water (see Figure 15522-1.)

**Figure 15522-1**



**15522-5 ASSOCIATED WATERWAY AND SMALL CRAFT BERTHING.** The basin (adjacent waterway) should be dredged to provide a minimum of 4' depth at MLLW. Bottom width at the ramp should be greater than the combined width of the launch ramp and boarding pier(s). Where required, small craft berthing should be planned and located in such a manner that it does not interfere with the actual launch procedures at the ramp or boat traffic within the basin. Any small craft berthing associated with this boat ramp facility should be captured under CCN 15520 Small Craft Berthing as a separate utilization on the boat ramp property record card.

**15522-6 PARKING AND CIRCULATION.** Small Craft Boat Ramp Facilities will require parking for prime mover and trailer combinations as well as any associated operational vehicles such as Humvees, pickup trucks, and passenger vans. Space allowances for parking, circulation, and apron areas at the boat ramp should be based on the criteria for CCN 14312 Operational Vehicle Parking/Laydown Area and captured in iNFADS under that category code. Note that this area under 14312 does not negate the need for parking allowances for the same vehicles at their permanent locations, usually operational facilities elsewhere at an installation.

## 156 CARGO HANDLING FACILITIES – BUILDINGS

### 156 10 WATERFRONT TRANSIT SHED (SF)

FAC: 1443

BFR Required: Y

15610-1 **DESCRIPTION.** A waterfront transit shed is a building or shed for storage of cargo awaiting further transshipment and requiring protection. For Covered Storage,

approximately 8,000 square feet of covered storage area is required for each 560 short tons, or 500 long tons, or 1000 measurement tons of cargo based on a conversion factor of 2.32 measurement tons per short ton. For conversion factors for determining storage requirements, see Section 440-2 General Supply Requirements in Category Code 440 Series. Average stacking height should be twelve feet.

The actual space assigned to an activity must be developed taking cognizance of many factors such as planned organization and mission changes, packaging and labeling requirements, commodity mix, local fire control procedures, MHE aisle space, etc. Therefore, the best approach to use for planning purposes is to develop a general square footage figure and then adjust that figure based on other quantitative/qualitative information available. It is recommended that the following criteria be used to develop a general square footage requirement:

- a. Average amount of cargo on hand per month.
- b. Average amount of receipts compared to issues per month.
- c. Largest amount of cargo on hand at any one month during the last year.
- d. Average hold time of cargo per month.

Basically, there are three situations that are taken into consideration for calculating the space requirements for the storage of cargo awaiting further transshipment and requiring protection. These situations are as follows:

Situation (1) A relatively uniform amount of cargo is stored each month throughout the year. Since there is relatively little discrepancy between the data obtained from a and c; the square footage requirements should be established at 10% more than the space needed at peak times.

Situation (2) A relatively uniform amount of cargo is stored each month throughout the year with the exception that there is a large discrepancy that results from a one-time situation as indicated from the data in c. The square footage requirement is established as 10% more than the average actual space used per month.

Situation (3) A relatively uniform amount of cargo is stored each month throughout the year with the exception that there is a discrepancy, which is recurring in nature and is predictable. The square footage requirement is established at 15% more than the average space needed during the peak times brought about by the discrepancies.

Data developed from b and d may be useful in explaining/factoring the developed requirements.

The same criteria should be used in determining space requirements for label cargo. It should be noted, however, that since quantities of label cargo on hand are usually small, modifications to existing facilities (firewalls, secure area, etc.) should be considered prior to initiating construction of new facilities.

**156 20 CONTAINER OPERATIONS BUILDING (SY)****FAC: 1443****BFR Required: Y**

15620-1 **DESCRIPTION.** A container operations building is essential for safe direction and control of container operations to promote efficient and continuous flow to, within, and from the handling area. It is located to provide visual sighting of and two-way communication with handling operating facilities, such as shiploading, rail track and truck corridors serving and penetrating the handling area. The building contains muster areas, locker space, toilets, lunch room facilities, and an administrative area for container operations. A 50-foot tower contains two rooms at 30-foot and 40-foot levels for visual observation of ship, rail, and truck corridors and operational facilities.

A total gross area of approximately 6,000 square feet will house 15 employees in the administration area, 100 employees in the locker room, and 125 employees in the lunch room. The tower will accommodate 12 employees in approximately 700 gross square feet. The usual remoteness of this facility may necessitate the provision of parking spaces for all employees.

**159 OTHER WATERFRONT OPERATIONAL FACILITIES**

This basic category group provides for facilities which cannot be coded in basic groups 151 through 156.

**159 10 AIRCRAFT DOCKING FACILITY (EA)****FAC: 1591****BFR Required: N**

15910-1 This category code is for inventory purposes only. It is intended for waterfront facilities that were originally created to support seaplanes such as PBV Catalinas and similar from the WWII era and later. It is not associated with any airfield criteria and new facilities will not be planned under this CCN.

**159 20 DEGAUSSING BUILDING (SF)****FAC: 1431****BFR Required: Y**

15920-1 **DESCRIPTION.** Degaussing is the science dealing with the methods and techniques of reducing a ship's magnetic field so that the possibility of detection by magnetic mines and other magnetic influence detection devices is minimized. It consists of two functionally interdependent installations: An underwater Degaussing Range installation (Category Code 159 21) and this facility, which serves as an instrument station. The degaussing facility records a ship's magnetic field as it passes over the Degaussing Range and notifies the ship as to what adjustments must be made to the

degaussing coils on board the ship (with the exception of submarines which have none) in order to reduce the ship's magnetic field to a safe operational level. If the vessel's magnetic field cannot be sufficiently reduced because of excessive permanent magnetization, the ship is scheduled to report for deperming (the process of reduction of permanent magnetism). See Category Code 159 30 for criteria relating to a deperming facility.

The sizing of this facility is determined by a study for the specific location and is directed by the equipment specified by NAVSEA.

### **159 21 DEGAUSSING RANGE (EA)**

**FAC: 1591**

**BFR Required: N**

15921-1 **DESCRIPTION.** A degaussing range is an area set aside in a channel or harbor that contains submerged instruments, connected to the computer in the degaussing building (Category Code 159 20), which registers a ship's magnetic signature as it passes through the range. The test equipment in the degaussing building indicates whether the internal degaussing system on board the ship is calibrated properly. If shipboard equipment is not within tolerance new calibration settings will be provided to the ship to neutralize the fields to within an acceptable tolerances. Shipboard equipment that is not operating properly will also be identified and if necessary the ship may be scheduled for deperming.

Range Location. The range site for the degaussing facility should be carefully selected because the type of range to be installed and the method of installation depend mainly on the depth of water. The water depth will vary in accordance with the size of vessel to be ranged. The shallow range is located in 15 to 30 feet mean water depth and is used to range minesweepers and other vessels of comparable size. The medium range, which is generally 45 to 60 feet below the surface, is used for surface combatants, auxillary and amphibious warfare ships. The deep range, used for heavy carriers and the like, is located in 75 to 100 feet of water. The variation in water depth should not be greater than 10 feet for a particular range (shallow, medium, and deep). The range location should be based on the following considerations:

- (1) Depth of water.
- (2) Types of sea bottom.
- (3) Tides and currents.
- (4) Position of range relative to range house.
- (5) Navigational hazards.
- (6) Heading of range (generally on a north-south magnetic heading).

The selection of a range site must be approved by local naval port authorities. Continental sites and installations must be approved by the U.S. Army Corps of Engineers. See Category Codes 159 20 Degaussing Building and 159 30 Deperming Building for additional information.

**159 30 DEPERMING BUILDING (SF)****FAC: 1431****BFR Required: Y**

15930-1 **DESCRIPTION.** A Deperming Building is a facility that contains electrical instruments used to regulate and monitor the deperming operation. Deperming, the second phase of degaussing, is the process by which a ship's permanent longitudinal and athwartship magnetism is removed and its permanent vertical magnetism stabilized at a low level. The deperming facility consists of a Deperming Building, which serves as an instrumentation building, a Deperming Wharf, Category Code 151 80, and, if required, a generator house. The Deperming Building floor area is determined by the amount of equipment and the number of personnel determined by NAVSEA. Pier size must accommodate any size ship that requires deperming. Plans must include electrical facilities capable of meeting the power requirements determined by NAVSEA.

**159 50 FERRY SLIP (EA)****FAC: 1591****BFR Required: N**

15950-1 **DESCRIPTION.** A ferry slip provides the anchorage for ferries while loading or unloading. It consists of water areas directly in front of transfer bridges and is usually bordered by fender racks. The offshore waters must provide maneuvering area for the largest ferry to be accommodated. Depth of water depends on the ferries accommodated. For design criteria, see Waterfront Operational Facilities, MIL-HDBK-1025/1.

**159 64 WATERFRONT OPERATIONS BUILDING (SF)****FAC: 1431****BFR Required: Y**

15964-1 **DESCRIPTION.** A Waterfront Operations Building provides administrative space for the functions associated with the management of a naval port, and support for all ship berthing and small craft maintenance including related electronics systems. It may provide space for functions such as a duty crew bunk room, crew's lounge, boatswain's locker, berthing for small boats if an integral part of the building, space for storage of boat gear and paint, oil spill equipment and a battery charging room.

This facility, which is under the cognizance of the officer in charge of port operations, is also staffed by personnel such as the dispatcher, dock master and harbormaster. Several functions performed are coordinating logistic support and harbor services, coordinating all movement of ships within the port as well as those entering and leaving, assigning ship berthing spaces, and providing pilots, operating tugs, service craft and small boats. The space for the office proper is based on the number of administrative people assigned. (See Category Code 610 10 for space allowances). Duty crew space shall be 85 net sf per person as detailed in Category Code 155 21. Space for the maintenance and boatswain's functions are determined by an industrial analysis for the



specific functions at each location. The industrial analysis shall include factors including the size of the port serviced, the size of the ships utilizing the port-and the frequency of movement of ships within the port and entrance channel(s).

In conjunction with the office space, a control tower with an unobstructed view of the entrance channel and berthing area may be provided. The tower space requirements should not exceed 600 gross square feet.

**159 66 LANDING CRAFT RAMP (EA)**

**FAC: 1591**

**BFR Required: Y**

15966-1 No criteria currently exists for this category code.

**159 70 DREDGE CONTROL/PUMPING FACILITY (GM)**

**FAC: 1591**

**BFR Required: N**

15970-1 **GENERAL.** The requirement for this facility is sized based on an engineering analysis for the conditions of the specific location.

**160 HARBOR AND COASTAL FACILITIES**

160-1 This category group includes all special facilities which may be required for protecting the harbor or coast against military action. This category also includes special facilities for mooring vessels and marine improvements for protecting the harbor land area or coastline from current or wave action and from flood conditions.

**161 HARBOR PROTECTION FACILITIES**

161-1 This basic category provides facilities for protecting the harbor against military action.

**161 20 FIXED NET ANCHORAGE (EA)**

**FAC: 1611**

**BFR Required: N**

16120-1 **DESCRIPTION.** This Category Code includes such functions as pile clusters and platforms used to support Anti-Terrorism/Force Protection (AT/FP) floating barriers. If a traditional submerged harbor net is used, this type of feature would also be required.

Typically, a Fixed Net Anchorage will require a means to connect and disconnect the floating barrier to allow for ships and other vessels to pass between the piers and wharves and the navigational channel. Barrier handling is typically done by service craft under the control of the Port Operations Department.

**161 30 WINCH HOUSE (EA)**

**FAC: 1611**

**BFR Required: N**

16130-1 **DESCRIPTION.** A winch house is a structure used in control of harbor nets, floating barriers and oil booms.

## **162 COASTAL PROTECTION FACILITIES**

162-1 This basic category provides facilities for protecting the coast against military action.

**162 10 GUN EMPLACEMENTS (EA)**

**FAC: 1499**

**BFR Required: N**

16210-1 **DESCRIPTION.** Space in strategic sites is provided on base for the installation of gun emplacements, including anti-aircraft guns, for use in harbor defense.

## **163 MOORINGS**

163-1 This basic category provides fixed structures for mooring vessels.

**163 10 MOORING DOLPHIN (EA)**

**FAC: 1631**

**BFR Required: N**

16310-1 **DESCRIPTION.** Mooring dolphins consist of clusters of timber, steel and concrete piles in planned patterns and spacing or can be closed structures such as sheet pile, steel or concrete caissons. Mooring dolphins are independent structures that are often placed at the outboard ends of piers or wharves to provide a mooring point that permits tying mooring lines at favorable angles without having to extend the entire pier or wharf structure. Mooring dolphins may have steel or concrete platforms used as pile cap structures and for mounting of mooring fittings. The timber piles are bound and secured by wire rope, shearing blocks, and bolts. Mooring dolphins are often connected to the main berthing pier or wharf by catwalks. Turning dolphins are used to deflect

ships and assist in their alignment as the ships approach and enter a slip. Naval installations with harbor or waterfront facility requirements for mooring of small craft and ships, up to carriers, may plan for mooring dolphins to insure the safety and protection of the vessels. The number, size, and type of dolphins are dependent upon the type of vessels involved, the complexity of the approach to the slip and the requirements for mooring the vessel under prevalent environmental loads.

16310-2 **DESIGN CRITERIA.** For typical dolphin arrangements and design requirements, see Piers and Wharves, UFC 4-152-01. For other technical design information, see Military Harbors and Coastal Facilities, UFC 4-150-06.

### **163 20 MOORING PLATFORM (EA)**

**FAC: 1631**

**BFR Required: N**

16320-1 **DESCRIPTION.** A mooring platform is an isolated structure consisting of a timber, steel or concrete deck supported on piling or can be a steel pile, sheet pile or concrete type caisson. Two or more platforms are provided in line for berthing of one or more vessels alongside. Mooring platforms provide facilities beyond those points where wharves or piers cease to function effectively as service or loading areas. Mooring platforms may include catwalks between each platform structure and the wharf. Mooring platforms are also referred to as breasting dolphins and allow a full length berth for large ships without the need for a full length wharf or pier. A berthing camel may be used between fender piles and the moored vessel.

16320-2 **DESIGN CRITERIA.** The mooring platform is shown in general plan and detail in Piers and Wharves, UFC 4-152-01.

### **163 30 STAKE PILE MOORING (EA)**

**FAC: 1631**

**BFR Required: N**

16330-1 **DESCRIPTION.** A stake pile mooring consists of a stake pile driven below the surface of the firm bottom of the ocean floor. A chain attached to the stake is used to moor the vessel. The advantages of using stake piles instead of anchors for moorings are that they are fixed anchorage points. The disadvantages are that the mooring lines do not equalize the pulls in a spread mooring; the stake pile, because it is fixed, does not absorb shock energy as well as an anchor; and finally, approval from the authority in charge of channel dredging is necessary before driving stake piles into a bottom. When dredging is required in an area where stake piles are located, there is some hazard of damaging dredge cutters. The holding capacity, size, and other design details of stake piles can only be accurately determined by an analysis of bottom soil borings and field investigations at the site.

16330-2 **BUOY, CHAIN AND ANCHOR TYPE MOORINGS.** Moorings used to tie off bow and stern lines for ships can also be buoy, chain and anchor type of designs.

These systems are equipment (personal property); they are not real property facilities and should not be categorized as stake pile moorings.

## 164 MARINE IMPROVEMENTS

164-1 This basic category provides structures for protecting the harbor, land area, or coastline from current or wave action and from flood conditions.

### 164 10 BREAKWATER (LF)

**FAC: 1641**

**BFR Required: N**

16410-1 **DESCRIPTION.** A breakwater is a freestanding barrier designed to break up and disperse heavy seas and to shield the waters of a harbor from wave action. Breakwaters are planned where primary protection is necessary to create or shelter a harbor or a basin for vessels from wave action. The type and quantity of breakwater is determined by local design considerations.

16410-2 **DESIGN CRITERIA.** Types of breakwater structures are shown in Piers and Wharves, UFC 4-152-01. For technical design information, see Military Harbors and Coastal Facilities, UFC 4-150-06.

### 164 20 GROINS AND JETTIES (LF)

**FAC: 1641**

**BFR Required: N**

16420-1 **DESCRIPTION.** Groins and jetties are structures built to intercept and deflect currents to control littoral drift and deposit of sand and silt.

16420-1.1 **Definition of Groins.** Groins are generally classified according to the principal construction materials used; that is, steel sheet piling, timber, stone, or concrete. A series of groins extending at right angles or parallel to the shoreline will protect the beaches from erosion. A groin serves to intercept currents that cause littoral drift of sand along a beach and under favorable conditions causes the deposition of sand, so as to reduce shore erosion.

16420-1.2 **Definition of Jetties.** Jetties are planned at harbor entrances and channels to control unstable conditions of silting and deposit of sand caused by river flow or tidal or wave action. A properly located jetty system will encourage scouring and maintain channel depth with a minimum of maintenance dredging. Jetties are similar in design to breakwaters, but are smaller.

16420-2 **DESIGN CRITERIA.** The types and lengths of groins and jetties will vary with local design considerations. Types and applications of groins and jetties are shown

in Piers and Wharves, UFC 4-152-01 and design details are shown in Military Harbors and Coastal Facilities, UFC 4-150-06.

### **164 30 LEVEES (LF)**

**FAC: 8714**

**BFR Required: N**

16430-1      **DESCRIPTION.** Levees are earthen embankments designed to protect property from water damage during the flood stage of rivers and/or other high water. The size and length of a levee will vary with local design considerations. Levees may be justified at air installations and at other naval installation where usable property must be protected from water damage.

## **169            OTHER HARBOR AND COASTAL FACILITIES**

169-1            This basic category provides for harbor and entrance control points and signal towers.

### **169 10 HARBOR ENTRANCE CONTROL FACILITY (EA)**

**FAC: 1611**

**BFR Required: N**

16910-1      **NET DEPOT.** Permanent installations from military control of a harbor entrance are not planned for peacetime, except that a large paved area may be planned, where appropriate, as a site for layout and assembly of harbor nets and allied equipment. The layout area should be near the waterfront and accessible to mobile cranes for net and equipment handling. The area is known as the net depot and is used for net maintenance and for training in net handling.

16910-2      **FLOATING BARRIERS.** Current AT/FP measures utilize a variety of floating barriers that are considered equipment installations. Specific requirements are determined for each location based on geography, wave action and the types of assets to be protected. See Category Code series 161 and 163 for information related to the installation of floating barriers. The Naval Facilities Engineering Services Center (NFESC) has conducted a number of floating barrier studies and can serve as a valuable planning resource.

## **170            TRAINING FACILITIES**

170-1            This category group covers facilities designated for the service career and reserve training of Navy and Marine Corps personnel. There are two basic categories under this code:

171            TRAINING BUILDINGS and

179            TRAINING FACILITIES OTHER THAN BUILDINGS

171/179-1 There are several specialized facility types such as auditoriums, drill halls, and others. Training facilities for general advancement of Navy/Marine Corps personnel, i.e., educational studies, which are conducted on an individual's own initiative and time, are planned under Category Code 740 88 (Educational Services Office).

## 171 TRAINING BUILDINGS

171-1 **General.** Facilities in this basic category are identified according to the nature of instruction provided. The major building types are:

171-1.1 **Academic Instruction Building** (Category Code 171 10). This facility provides accommodations for classroom lecture instruction, using chairs with fixed table arms, tables, desks or other similar working surfaces.

171-1.2 **Reserve Training Building** (Category Code 171 15). This facility is utilized for training Navy and Marine Corps Reserves.

171-1.3 **Applied Instruction Building** (Category Code 171 20). This facility is used to accommodate training through the use of equipment and tools such as drafting tables, workbenches, machinery, equipment or functional systems.

171-1.4 **Operational Trainer Space** (Category Code 171 35). This space is required to accommodate highly specialized real-life simulation training that needs specifically designed space within a building or a separate building. The size and configuration of these specialized spaces differ considerably from a typical applied instruction classroom.

171-2 **Space Type.** Training Buildings generally consist of three different types of spaces, classrooms, support and circulation, and service areas. The following is a description of the spaces and their components. See Table 171-1 for space allowances.

### 171-2.1 Classroom Spaces

171-2.1.1 **General Academic Space.** These classrooms devoted to lecture space are academic instruction classrooms defined under Category Code 171 10. Use Table 17110-1 for space allowances.

171-2.1.2 **Modified Academic Space.** This space consists of a lecture/laboratory combination classroom and is used for both lectures and practical exercises involving hands-on disassembly and assembly of small training aids applicable to the subject matter. A class that requires standard office desks is included in this category. Area includes workspace, circulation, teaching station and book storage. These classrooms are identified under Category Code 171 10.

171-2.1.3 **Workbench Lecture Space.** This space is for an instructional laboratory, the size of which may be only determined on an individual basis. The facility planners have to take into consideration the student/equipment/ instructor ratio which determines the numbers of instructional or test equipment per student station and consequently the space requirements, For example, electronics-related training requires approximately 6 linear feet of workbench resulting in approximately 50 to 55 net SF classroom space per student station, including circulation. Individual justification must accompany EWR submittals.

171-2.1.4 **Space for Hands-on Mockups.** This space is for a classroom in which instruction is given to individual or groups of students on stationary training devices representing all or part of an operating system. The size of this type classroom is generally determined not by the number of students, but by the physical size of the equipment. Figure 17120-1 under Category Code 171 20 provides a formula, which may be used to determine the required net floor space. A single line layout drawing indicating major dimensions should accompany BFR submittals.

171-2.1.5 **Learning Centers.** The learning center is a classroom utilized by students for individual study where training is conducted on a self-paced basis. It is space equipped with study carrels either designed for reading only or equipped with audio-visual training media. Since the self-paced training system has an unstructured time frame (i.e., students may use the facility whenever they have time available), the number of study carrels must be determined individually, the BFR submittal must show these calculations which should be based on the overall number of students requiring such facilities and the estimated number of students which are anticipated to use a learning center at a given time.

171-2.1.6 **Modified Academic Classroom.** This room is equipped with desks or other working surfaces in lieu of standard chairs with fixed tablet arms. Space requirements are 45 net SF per student station, including circulation. Larger areas require justification. These spaces are identified under Category Code 171 10.

## 171-2.2 **Support Spaces**

171-2.2.1 **Instructor's Work Space.** Facilities should be provided for each instructor to perform his administrative and preparatory duties.

171-2.2.2 **Instructor's Lounge.** The fixed allowance shown in Table 171 A assumes that no more than 10 instructors will be present at one time. Reduce this area proportionally if smaller use is anticipated. An increase in space above the amount indicated requires specific justification.

171-2.2.3 **Student Break Area.** This space should accommodate the average number of students scheduled to have a class recess at any given

time. It can be provided at one location or dispersed in several locations throughout the school building.

171-2.2.4 **Library.** Due to the relative complexity of library operations, required space is broken down as follows:

- **Reading Area.** To estimate the number of persons utilizing this facility, use 20% of the average on board student load.
- **Stack Area.** Allowance given in Table 171-1 is based on 100 volumes per 3 linear feet section, 7.5 feet high, or 15 volumes per net square feet of floor area.
- **Media Storage.** Allowance given in Table 171-1 is based on storage of 424 DVDs or 260 VHS tapes in a section of shelving 3 feet long by 6 feet high in a space 3 feet wide. The width of this floor space provides for the cabinet depth plus half the width of an access aisle.
- **Staff Area.** Includes files, administration, reproduction space and material preparation area.

171-2.2.5 **Administrative Space.** This is space required for functions related to overall administration of the training facility in question and the allowances are governed by the number of administrative personnel. Planning procedures and net space allowances are the same as for Category Code 610 10 (Administrative Office), planning method 2 (detailed planning factors). The broad planning factor of 162.5 gross SF per occupant, under Category Code 610 10, may not be used because it would duplicate some of the support space allowances already provided for under this Category Code series 171.

171-2.2.6 **Training Aid Storage.** The space allowance is shown on Table 171-1.

171-2.2.7 **Other Support Spaces** not listed above must be identified separately and specific justification should accompany BFR submittals.

171-2.3 **Service Areas and Circulation.** These areas represents all spaces not in direct support of the training function, including walls, rest rooms, mechanical equipment, halls and corridors.

### 171-3 **PLANNING PROCEDURES**

Choose one of the following three methods to compute classroom net square feet space requirements.



171-3.1 **Average On Board.** This method is straightforward in the calculation of classroom space requirements. The formula requires a minimum amount of information as follows:

171-3.1.1 **Number of Students.** Total number of students per year for each course.

171-3.1.2 **Number of Days.** Total number of days (duration) to complete the course.

171-3.1.3 **Square Feet.** The proper choice of square feet per student from Table 171-1 based on the type of classroom instruction.

171-3.2 **Classroom Scheduling Method** The method that is preferred sometimes because it's easier to picture classrooms with a set number of students and a drawn schedule. The schedule shows an overall view of the student loading per month and gaps in classroom scheduling. The following minimum information is needed:

171-3.2.1 **Number of Students.** The number of students planned for each classroom.

171-3.2.2 **Course Time.** The duration of each course and the number of times taught throughout the year.

171-3.2.3 **Classroom Uses.** A decision on whether or not the classroom can be used for other courses.

171-3.3 **Student Time Distribution Method.** This method uses a more involved accounting system to estimate time expenditures for different types of course instruction. The method shows a detail study and breakdown of planned time distribution in labs, lectures and special applications classes. More information is required than in the other two methods.

In addition to computing classroom space requirements, develop the requirements for Support Spaces separately. Convert final totals to gross square feet.

## SPECIAL NOTES FOR PLANNING PROCEDURES

1. Any construction project, regardless of funding source, submitted for authorization must be accompanied by detailed supporting documentation (broad planning factors cannot be used in lieu of detailed analysis).
2. Planning for training buildings shall be based on maximum utilization of available classrooms. To this end, the number and sizes of classrooms shall be determined on the basis of a detailed study encompassing curricula, group sizes, schedules, security and proximity requirements, and/or any other pertinent aspects. It is recognized that a number of subjects, especially in the applied instruction field,

require extensive training aids or special classroom configurations. Every attempt must be made, however, to minimize the number of such single subject or “dedicated” classrooms, especially in those cases where their use would be relatively infrequent. Cross-scheduling of classroom use must be considered on an installation-wide basis, crossing organizational boundaries if necessary.

3. As a general rule, most training buildings will consist of a mixture of different types of instructional space (normally a combination of academic and applied instruction). For buildings of this type, the specific applicable criteria must be utilized to plan the facility in question even though a resulting project may carry only a single Category Code (171 10 or 171 20). For example, an applied instruction building (Category Code 171 20) contains academic classrooms utilized to teach basic or familiarization aspects of an applied instruction curriculum. In such case, academic classrooms are sized using code 171 10 criteria, although on planning documentation, this space will eventually be combined with the figures for the applied instruction (Category Code 171 20) portions of the facility.

#### 171-4            **COMPUTATION METHODS FOR COMPUTING CLASSROOM SPACE**

##### 171-4.1    **Average On Board**

171-4.1.1        Use Figure 171-1 and list the courses of instruction conducted by the Activity. List the requirements in separate categories (e.g. general academic, lab-lecture, etc).

171-4.1.2        Show the Course Data Processing Code (CDPC), course title, and other requested information. The columns of information are defined at the bottom of the table. Information is available in the Master Course Reference File (MCRF) of the Navy Integrated Training Resources and Administrative System (NITRAS) and other sources.

171-4.1.3        Use the AOB formula to calculate the number of students per class.

171-4.1.4        Based on the type of instruction, select the proper square feet per student from Table 171-1.

171-4.1.5        Calculate the Required NSF for each course.

171-4.1.6        Add the Required NSF column to obtain the total requirements.

##### 171-4.2    **Classroom Scheduling Method**

171-4.2.1        Use Figure 171-2 and list each course.

171-4.2.2 Assume the courses meet all day. If a course meets during the AM hours in a room and a different course can meet in the same room during PM hours, assume one room requirement.

171-4.2.3 Draw a line through the number of weeks the course is held each time during the year.

171-4.2.4 Show the week the course begins and ends each time. Show the number of students planned for each course above the course duration line.

171-4.2.5 After the class scheduling is drawn, use Figure 171-3 to organize the requirements. List each course, type of class space, number of students for each classroom and the square feet used to calculate requirements obtained from Table 171-1.

171-4.2.6 Determine whether or not the classroom requirement should be dedicated strictly for the course or if other courses can be scheduled in the same room.

171-4.2.7 Use one of the following formulas to calculate space requirements and show the calculation in Figure 171-3 Column E or F.

171-4.2.8 Total Classroom requirement is the sum of Columns E and F. Separate the totals into classifications (e.g., total general academic, lab-class, etc., space).

**Dedicated Classroom** - This classroom has permanently installed demonstrations, mock-ups, laboratory equipment, or special teaching aids. The room is usually not conveniently set-up for teaching other courses.

$$\boxed{\begin{array}{c} \text{Dedicated} \\ \text{Classroom} \\ \text{Requirement} \\ \text{NSF} \end{array}} = \boxed{\begin{array}{c} \text{No. Pupils per} \\ \text{Course in} \\ \text{Classroom} \end{array}} \times \boxed{\begin{array}{c} \text{Table 171-1} \\ \text{Type Class} \end{array}}$$

**Partial Classroom Requirement** - This condition applies to courses that can meet in general classroom areas or courses that meet less than 60% of a 250-day school year.

$$\boxed{\begin{array}{c} \text{Partial} \\ \text{Classroom} \\ \text{Requirement} \\ \text{NSF} \end{array}} = \boxed{\begin{array}{c} \text{No. Pupils} \\ \text{per Course in} \\ \text{Classroom} \end{array}} \times \boxed{\begin{array}{c} \text{Table 171-1} \\ \text{Type Class} \\ \text{Sq. Ft.} \end{array}} \times \boxed{\begin{array}{c} \text{Total Course} \\ \text{Days per} \\ \text{Year} \end{array}}$$

School Year = 250 class days per year.

**171-4.3 Student Time Distribution Method**

171-4.3.1 Use Figure 171-4 to enter information.

171-4.3.2 Organize the list of planned courses according to the anticipated number of students in each classroom.

171-4.3.3 Group the courses in descending class sizes (e.g. classes with 40, 30, 20, students etc.) in Columns A and B.

171-4.3.4 Show the course duration in number of weeks. Use fractional weeks as necessary.

171-4.3.5 In Columns E, G, I, and K show the estimated percentage of time spent in each type of class (e.g., 50% lecture, 50% lab).

171-4.3.6 In Columns F, H, J, and L, show the equivalent weeks per year for the types of instruction (e.g., Col F = (C) x (D) x (E))

171-4.3.7 Total the weeks in Columns F, H, J, and L.

171-4.3.8 Organize the data according to types of instruction and class sizes as shown in the example Figure 171-4.

171-4.3.9 Calculate the classroom sizes from the square feet allowances per student shown in Table 171-1. For example, to calculate a general academic classroom for 8 students, use 22 sq ft from Table 171-1, which refers user to Table 17110-1.

171-4.3.10 Therefore,  $8 \times 22 = 176$  sq ft. Use the same calculation method for labs and the other types of classroom spaces.

171-4.3.11 The totals in the Classroom Computation Schedule show the number of classrooms and net square feet.

Figure 171-1. Classroom Space Requirement Computation

Course CDP	Course Short Title	Duration in Days (DD)	Annual Frequency (AF)	Pupils Per CL (S)	Annual Input (AI)	Student AOB *	NSF Per Student (NSF)	Requirement Net Area **
Total Student AOB and Total Requirement in Net SQ. FT.								

$$* \text{ Student Average on Board (AOB)} = \frac{\text{Duration (DD)} \times \text{Annual Input (AI)}}{250 \text{ (Classroom Days Per Year)}}$$

$$** \text{ Required NSF Area} = \text{AOB} \times \text{NSF} \times 1.5$$

Round all Fractions to the next highest whole number  
 School year = 250 class days

- NSF = Select proper square feet per student from Table 171-1 according to type of installation
- CDP = Course Data Processing Code
- DD = Duration of course in actual classroom days
- AF = Number of times course is taught per year
- AI = Number of students trained annually AI = (AF) x (S)
- 1.5 = A utilization factor required to compensate for the inability to completely schedule classes and fully use classroom capacity.

Figure 171-2. Classroom Scheduling Method Type of Training Space: Various

Course Title	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Remarks
AN/xyz	15		15		15		15		15		15		
BB Applied	10		10		10		10		10		10		
CD Lab		6		6		6		6		6		6	
Total Student Loading/Month	25	16	25	16	25	16	25	16	25	16	15	6	

Figure 171-3. Calculation Summary – Scheduling Method

(A) Course Desc.	(B) Type of Class	(C) No. of pupils per class	(D) Sq. Ft. Used Table 171-1	(E) Dedicated Room Sq. Ft.	(F) Partial or Gen Class Sq. Ft.
AN/xyz	Lecture	15	22		330
BB Applied	Mod Lec	10	30		300
CD Lab	Lab	6	45	270	
Totals				270	630

Figure 171-4. Course Data and Student Time Distribution

Course Title (arranged by decreasing size)	Class Size	Frequency of Class per Year	Duration of Class in Weeks	% Time in General Academic classroom or Lecture Space	Weeks per Year (F=CxDxG)	% Time in Modified Academic Classroom or Modified Lecture Space	Weeks per Year (H=CxDxG)	% Time in Work-Bench Type Space	Weeks per Year (J=CxDxI)	% Time in Hands-On-Mockups	Weeks per Year (L=CxDxK)	% Time Elsewhere
A	B	C	D	E	F	G	H	I	J	K	L	M

Explanation:

- Column B - Projected student loading for the designated class
- Column C - Number of times per years course is offered
- Column D - Individual course duration in weeks
- Column E G I K - Percentage of actual student’s instructional time spent in the various classroom types.
- Column F H J L - Requirements of that particular class room size and type by number of weeks.



**Example Figure 171-4. Course Data and Student Time Distribution**

<b>Course Title</b> (Arranged by decreasing class size)		<i>(NOTE: Same column headings as Figure 171-4)</i>										
<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>H</b>	<b>I</b>	<b>J</b>	<b>K</b>	<b>L</b>	<b>M</b>
AAA-0000	40	25	-4	100%	10							
ABC-XXXX	40	10	2	100%	20							
40 PN Totals					30							
DEF-XXXX	20	6	2	50%	6	50%	6					
GHI-YYYY	20	3	10	100%	36							
JKL-1234	20	5	10	50%	25	20%	10			30%	15	
MNO-6250	20	2	5	25%	3	50%	5	25%	3			
PQR-1111	20	50	0.6	100%	30							
29 PN Totals					100		21		3		15	
ABD-0001	10	5	10	100%	50							
ABD-0002	10	2	20	50%	20	50%	20					
ABD-0003	10	25	1	100%	25							
ABD-0004	10	50	0.4	100%	20							
10 PN Totals					115		20					

**Explanation:**

- Column B - Projected student loading for the designated class
- Column C - Number of times per year course is offered
- Column D- Individual course duration in weeks
- Columns E G I K - Percentage of actual student’s instructional time spent in the various classroom types
- Columns F H J L - Requirements of that particular classroom size and type by number of weeks

**Classroom Computations**

Refer to Figure 171-4

Class Size	Total Weeks Per Year Required	/	50 Weeks Per Year	=	Computed Classroom Requirement *	Actual Classrooms Required **		Size ***	=	Net
								Square Feet		
<b>General Academic Classroom or Lecture Space</b>										
40 PN	30	/	50	=	0.6	1 Each	X	800 NSF	=	800
20 PN	100	/	50	=	2.0	2 Each	X	440 NSF	=	880
10 PN	115	/	50	=	2.3	3 Each	X	220 NSF	=	660
Total						4.9	6 Each			
<b>Modified Academic Classroom or Modified Lecture Space</b>										
20 PN	21	/	50	=	0.4	1 Each	X	20 PN x 45 NSF	=	900
10 PN	20	/	50	=	0.4	0				
Total						0.8	1 Each			3240 NSF

- Workbench type space (Use Individual Justification)
- Hands-on-Mock-ups (Use Formula in Figure 17120-1)

\* Allows for Holiday stand downs and scheduling flexibility

\*\* Actual classroom required must equal or exceed computed classroom requirement. Number of required classroom must take into account the excess time available in larger size rooms, i.e., smaller classes can use available excess time in larger rooms.

\*\*\* Size data follows Table 171-1

Table 171-1. Space Allowances for Instruction Facilities

Type of Space	Maximum Allowances
<b>1. CLASSROOM SPACE</b>	
a. General Academic	Use Table 17110-1 allowances
b. Modified Academic Space	30 net SF per student station
c. Lecture-Lab Space	45 net SF per student station
d. Modified Academic with office desks	45 net SF per student station
c. Workbench Type Space	Individual justification required
d. Hands-On Mockup Space	Use formula given in Fig. 17120-1
e. Learning Centers	40 net SF fixed allowance
<b>2. SUPPORT SPACE</b>	
a. Instructor's Work Space	60 net SF per instructor
b. Instructor's Lounge	450 net SF fixed allowance
c. Student Break Area	6 net per student
d. Library	
(1) Reading Area	25 net SF per person
(2) Stack Area	6.6 net SF per 100 volumes
(3) Media Storage	9 net SF per 424 DVDs or 260 VHS tapes
(4) Media Viewing Room	100 net SF fixed allowance
(5) Staff Area	10% of sum of reading stack, film storage and viewing areas
e. Administrative Space	Use category code 610 10 detailed criteria
f. Training Aid Storage	1.5 net SF per student station
g. Other Support Spaces	Individual justification required
<b>3. CIRCULATION AND SERVICE AREAS</b>	
(Net to Gross Conversion)	Multiply NSF by 1.33

Note: Student station is defined as a classroom seat or shop workbench area designated to accommodate one student.

**171 10 ACADEMIC INSTRUCTION BUILDING (SF)****FAC: 1711****BFR Required: Y**

17110-1 A facility dedicated entirely to academic instruction will seldom be planned. In most cases, instruction of this type will be part of another training function, such as at a Service School or conducted in some other type of applied instruction building. The criteria for this type facility are based on net classroom square feet per student seat.

For planning purposes, academic classrooms can be divided into two general categories:

17110-1.1 **General Academic Classroom** - is one which supports approved training programs and provides accommodations for classroom lecture instruction, using standard chairs with fixed tablet arms or a similar seating configuration providing the student a writing surface and book depository. An instructor station is provided, with space for the use of portable training aids. The individual general academic classroom sizes in net square feet (i.e., within the interior walls of the room), as dictated by the required number of seats, shall not exceed the figures given in Table 17110-1.

17110-1.2 **Modified Academic Classroom** - is one which is equipped with desks or other working surfaces in lieu of standard chairs with fixed tablet arms.

**17110-2 Planning Steps**

17110-2.1 The number and size of individual classrooms must be determined in accordance with the general guidelines given under the topic Planning Procedures in the preceding general section for Basic Category 171.

**17110-2.1.1 Gross Square Feet - Broad Planning**

The space allowances for general and modified academic classrooms represent net classroom space only. The requirements for supporting spaces must be calculated separately in order to obtain gross SF building area. This may be done by either one of the two alternate methods:

- In the absence of detailed data during early stages of planning, the gross SF building area (including all necessary support space) shall be computed as follows:
  - In cases where the training building is composed entirely of general academic classrooms, use the broad planning factor of 45 gross SF per student station for the entire building.

- In cases where some or all of the classrooms are of the modified academic classroom type, by using the broad planning factor of 75 gross SF per student station for the entire building.
- In cases where, within an academic training facility, a number of classrooms must be modified to accommodate working surfaces different than standard chairs, the net area for such modified academic classrooms may be increased. For instance, modified academic classrooms (with standard office desks) will require approximately 45 net SF per student station, including circulation. Larger increases will require specific justification.
  - Maximum consideration must be given to provide a variety of classroom sizes in order to optimize space utilization.

**Table 17110-1  
Space Criteria for General Academic Classrooms**

No. of Seats	Sq. Ft. per Seat
20	22
30	21
40	20
50	19.5
60	19
70	18.5
80	18
81 to 90	17
91 to 100	16
101 to 120	15.5
121 to 140	15
141 to 160	14.5
161 to 180	14
over 180	14

**171 15 NAVY AND MARINE CORPS RESERVE TRAINING (SF)****FAC: 1714****BFR Required: Y**

NOSC Space Program spreadsheet, located at: <https://www.wbdg.org/ffc/dod/unified-facilities-space-program-sustainability-spreadsheets>

Design Criteria: FC 4-171-06N “Navy Operational Support Center”  
<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/fc-4-171-06n>

17115-1 **DEFINITION.** Navy and Marine Corps Reserve Centers provide training, organizational and administrative support to Reserve units and their supporting functions. This category code refers to the Reserve Training center only. Criteria for other facilities which support the Reserve unit personnel (e.g., Bachelor Housing, Dining, Aircraft Maintenance Hangars, etc.) are not included in this section and follow the same criteria as active duty counterparts. Refer to Appendix A of this UFC for a function / category code cross-reference.

17115-2 **LOCATION:** In many instances, the Reserve Center may be located outside of the perimeter of a formal DoD Installation. In these cases, it is important to refer to UFC 4-010-01 “DoD Minimum Antiterrorism Standards for Buildings” for guidance relative to the necessary Force Protection elements to consider while planning new Reserve unit facilities and renovation of existing facilities.

17115-3 **NAVY OPERATIONAL SUPPORT CENTER (NOSC):** A facility for use by Naval Reserve Units for training and organizational requirements.

17115-3.1 **Capacity.** The space allowances for a Naval Operational Support Center shall be determined on the basis of the **maximum weekend drill population**, not total drill population numbers. Other important factors determining capacity include the number of Full Time Staff (FTS) and the total number of Reserve Units utilizing the drill site.

17115-3.2 **Joint Space Allowance.** When two or more Services are combined into a single joint reserve facility, 50% of the smallest individual Service requirements for medical, janitorial, and male and female toilet areas shall be added to the largest individual Service’s requirement for each respective area.

17115-3.2 **Space Criteria.** The gross square footage allowance for Administrative, Medical, Unit Area and Drill Hall spaces in the NOSC are obtained from the NOSC Space Program spreadsheet which can be found at <https://www.wbdg.org/ffc/dod/unified-facilities-space-program-sustainability-spreadsheets>.

Optional additive spaces for specific Unit requirements are provided in Tables 17115-1 through 17115-6, which should be added to the net results provided by the

space program spreadsheet (if applicable) and increased by the 35% NTG factor for circulation, etc. (For Marine Corps Reserve Centers, refer to paragraph 17115-5. The space program spreadsheet does not apply to the Marine Corps Reserve Centers).

17115-4 **NOSC OPTIONAL ADDITIVE SPACES:** In specific cases, Reserve units are authorized additional space for applied training, simulators, or maintenance when authorized equipment is present at reserve centers. The following tables are provided as examples of additional requirements.

**Table 17115-1 Additive Space Criteria for Cargo Handling Battalion (NRCHB)**

<b>Cargo Handling Battalion (NRCHB):</b>		
<b>Administrative/Training Facility</b>	<b>@ Reserve Readiness Sites (RSS)</b>	<b>@ NOSC</b>
Classrooms	1600 NSF	
Toilets/Showers	700 NSF	
Administrative	2800 NSF	230 NSF
Locker Room	735 NSF	
Storage	1500 NSF	700 NSF
Rigging Shop	325 NSF	325 NSF
<b>Total for Admin./Training Facility (net)</b>	<b>7660 NSF</b>	<b>1255 NSF</b>
Vehicle Maintenance Facility (GSF)		2910 GSF
Vehicle Storage (GSF)		1820 GSF
<b>Total for Vehicle Maint.functions (gross)</b>		<b>4730 GSF</b>
Ship mock-up (1 each) ( see note 1 )	3700 SF	3700 SF
Simulated Pier (0.25 Acre) ( see note 1 )	1172 SY	1172 SY
Organizational Vehicle Parking	680 SY	680 SY
Staging Area (paved)	1 ac	1 ac
Lay down Area (paved)	556 SY	556 SY
Training Site ( see note 2 )	5 ac	5 ac

**NOTES**

- 1 The ship mock-up and simulated pier are authorized only when there are no Maritime Administration (MARAD) ship or other ships available for training.
- 2 Five (5) acres of constructible land are required only if a MARAD ship is not available and the mock-up trainer is constructed. Actual requirements will be developed as a result of Master Planning and site layout.

**Table 17115-2 Additive Space Criteria for Mobile Mine Assembly Group (MOMAG)**

<b>Mobile Mine Assembly Group (MOMAG):</b>		
	<b>@ RSS</b>	<b>@ NOSC</b>
Vault	-	18 SF
Shop	-	400 SF
<b>TOTAL (net)</b>		<b>418 SF</b>

**Table 17115-3 Additive Space Criteria for Expeditionary Logistics Support Force (NRELSF)**

<b>Expeditionary Logistics Support Force (NRELSF):</b>		
	<b>@ RSS</b>	<b>@ NOSC</b>
Administration/Training	8100 SF	-
<b>TOTAL (gross)</b>	<b>8100 SF</b>	<b>-</b>
POV parking	980 SY	-
<b>TOTAL</b>	<b>980 SY</b>	<b>-</b>

**Table 17115-4 Additive Space Criteria for Sea-Air-Land (SEAL) Unit**

<b>Sea-Air-Land (SEAL) Unit:</b>		
Diving Equipment Maintenance and Storage	-	390 SF
Boat Storage	-	250 SF
Locker Room	-	300 SF
<b>TOTAL (net)</b>	<b>-</b>	<b>940 SF</b>



**Table 17115-5 Additive Space Criteria for Inshore Boat Unit (NRIBU)**

<b>Inshore Boat Unit (NRIBU):</b>		
	<b>@ RSS</b>	<b>@ Reserve Centers</b>
Classroom (Only if not co-located at a Center)	726 SF	
Administration/Training Support	1521 SF	345 SF
Shower (2 each for male and female @ 20 SF each)	80 SF	
Locker (120 SF male plus 60 SF female)	180 SF	180 SF
Storage	800 SF	800 SF
Armory	45 SF	45 SF
<b>TOTAL (net)</b>	3352 SF	1370 SF
Boat Storage Area	1205 SF	1205 SF
<b>TOTAL (gross)</b>	1205 SF	1205 SF
Organizational Vehicle Parking	250 SY	250 SF
Private Owned Vehicle Parking (POV)	1008 SY	1008 SY
<b>TOTAL</b>	1258 SY	1258 SY

<b>Mobile Diving and Salvage Unit (NRMDSU):</b>		
Interior Storage	860 SF	860 SF
SCUBA Locker	240 SF	240 SF
Shop	400 SF	400 SF
Diver Personnel Lockers	225 SF	225 SF
Showers/Heads (Do not include if co-located at a Center)	225 SF	
Multipurpose Area (Do not include if co-located at a Center)	280 SF	
Admin/Office (Do not include if co-located at a Center)	540 SF	
Flammable Storage (56 SF portable bldg)	0 SF	0 SF
<b>TOTAL (net)</b>	2800 SF	1725 SF

17115-5 **MARINE CORPS RESERVE CENTER:** Space allowances for these facilities will accommodate the range of personnel listed as column headings shown in Table 17115-7 (e.g. 50 to 150 persons, etc.). Square footages for each range are based upon the design capacity listed at the top of the column. To determine the facility requirement, choose the range in Table 17115-7 that corresponds to the units projected personnel loading (found in the USMC Table of Organization). Units with loading outside of the range of Table 17115-7 require special justification, and the user should consult the Naval Facilities Engineering Command or Headquarters, USMC for planning assistance.

Tables 17115-7, 17115-8, and 17115-9 are to be used only as a guide. Changes to individual functions are acceptable given adequate justification. Tables 17115-7, 17115-8, and 17115-9 Special Requirements, are not intended for all centers and require approval from Headquarters, USMC and Commander, Marine Forces. For further assistance, see other category codes, Architectural Design Standards or contact Naval Facilities Engineering Command or Headquarters, USMC.

**Table 17115-7 Space Criteria For Marine Corps Reserve Centers  
Training and Administrative Building**  
(All Numbers are Net Square Feet Unless Noted)

Functional Area	Drill Strength 50 to 150	Drill Strength 151 to 250	Drill Strength 251 to 350	Drill Strength 351 to 450
<b>A) JOINT USE SPACE</b> (See Table 17115-7(a) for space derivation data)				
Drill Hall	5,850	5,850	6,300	6,750
Classrooms	1,500	2,500	3,500	4,500
Medical Examination	650	650	650	650
Conference Room	225	375	525	675
Janitorial Space	200	200	200	200
Toilets/Showers: Male	400	500	600	700
Toilets/Showers: Female	250	300	350	450
Day Locker Room (Marines)	200	350	475	600
Lounge	200	300	400	500
Mechanical Equipment	400	500	600	700
Subtotal of Part A: Joint Use Space	9,875	11,525	13,600	15,725

**Table 17115-7 Space Criteria For Marine Corps Reserve Centers  
Training and Administrative Building**  
(All Numbers are Net Square Feet Unless Noted)

Functional Area	Drill Strength 50 to 150	Drill Strength 151 to 250	Drill Strength 251 to 350	Drill Strength 351 to 450
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<b>B) EXCLUSIVE USE SPACE</b> <i>(See Table 17115-7(a) for space derivation data)</i>				
Administrative Offices	2,500	3,100	3,900	4,700
Conference Room	350	450	550	650
Recruiting	400	400	400	400
Training Aids (Training Storage/Storage)	100	100	100	100
Multi-Media Center/LAN Control Center	25	25	25	25
IMST Trainer	1,050	1,050	1,050	1,050
Armory/Security Vault	800	800	800	800
Shops-Comm. Maintenance	700	700	700	700
Lockers (Double Size)	1,575	2,625	3,675	4,725
Supply Storage	3,500	4,000	4,500	5,000
Exercise / Fitness Center	900	1,500	2,025	2,600
Subtotal of Part B: Exclusive Use Space	11,900	14,750	17,725	20,750

**Table 17115-7 Space Criteria For Marine Corps Reserve Centers  
Training and Administrative Building**  
(All Numbers are Net Square Feet Unless Noted)

<b>C) SPECIAL REQUIREMENTS</b>				
Special requirements are not included in all Reserve Centers. Each function is justified by a unit's particular mission. These functions are to be part of the Reserve Center interior floor plan (should have 25% added for walls and circulation accordingly). Each function must be approved by Headquarters, USMC and Commander, Marine Forces Reserve. (See Table 17115-7(a) for space derivation data)				
<b>Functional Area</b>				<b>All drill strengths</b>
Food Service Galley				400
Photo Unit (Dark Room)				100
Mobilization Station				500
Food Service Storage				700
Classified Material Storage				200
Communications/Electronics Shop				700
Medical Logistics Storage				5,000
Embark Storage				800
Dental Officer Office				180
Medical Officer Office				180
Subtotal Part C. Special Requirements Space				

Total of Parts A, B, & C	
Net to Gross Factor for Walls, Circulation, & Common Areas (25%)	
Total GSF Requirement for Reserve Center	

**Table 17115-7(a) Derivation of Space Allowances for Table 17115-7**

<b>A. JOINT USE SPACE</b>	
Assembly Hall (Navy)/Drill Hall (Marine)	Minimum space is based upon full size basketball court. Space should accommodate 100% of the drill population for all hands events: equipment staging area, unit formations and physical fitness.
Classrooms	Size based upon 50% of drill population being in class at any given time, to include space for computers and audio/visual equipment (use 20 SF per student).
Medical Examination	Fixed size.
Conference Room	Size based upon 10% of drill population (use 15 SF per person)
Janitorial Space	Fixed size consistent with architectural standards.
Heads/Showers, Male	Size based upon OSHA standards of 1 toilet for each 10 personnel (with the appropriate mixture of toilets/urinals) and 1 shower head for each personnel (up to a maximum of 35 shower heads)
Heads/Showers, Female	Size based on minimum of 5% of drill population is female (1 toilet for each 10 personnel).
Lounge	Fixed size.
Day Locker Room (Marine)	Size based on 50% of drill population requirement for 1 day locker with lockers double stacked (each locker and bench is 5.3 SF).
<b>B. EXCLUSIVE USE SPACE</b>	
Administrative Offices	Variable size based on 18-12% of the drill strength (use 90 SF per person)
Conference Room	Size based upon 100% of active duty T/O (use 15 SF per person)
Recruiting	Fixed size.
Training Aid Storage	Fixed size.
LAN Control Center	Fixed size.
ISMT Training Room	Minimum size per training unit is 1,050 SF with a minimum ceiling height of 10 feet (each additional trainer requires another 1,050 SF).
Armory/Security Vault	Minimum size is 800 SF (for additional guidance use Cat Code 143-45). Size may increase based on units T/E.
Communication Maintenance Shop	Minimum size is 700 SF (for additional guidance use Cat Code 217)
Lockers	Size based on 100% of drill population requirement for 1 double-size locker per person.
Exercise/Fitness Center	Fixed size based on 15% of drill population working out at any one time (38.5 SF per person reference MIL-HDBK 1037/8).
Supply Storage	Minimum size listed with a minimum ceiling height of 20 feet (for additional guidance use Cat Code 441-10)

**Table 17115-7(a) Derivation of Space Allowances for Table 17115-7 (Cont'd)**

<b>C. SPECIAL REQUIREMENTS</b>	
Food Service Galley	Fixed size (400 SF)
Photo Unit (Dark Room)	Fixed size (100 SF)
Mobilization Station	Fixed size (500 SF)
Food Service Storage	Fixed size (700 SF)
Classified Material Storage	Fixed size (200 SF)
Communications/Electronics Shop	Fixed size (700 SF)
Medical Logistics Storage	Fixed size (5,000 SF). Should have a roll-up door for vehicle access
Embark Storage Shed	Fixed size (800 SF). Structure will have a vehicle access with roll-up door.
Dental Officer Office	Fixed size (180 SF). Only for dental battalions.
Medical Officer Office	Fixed size (180 SF). Only for medical battalions.

**Table 17115-8 Space Criteria for Marine Corps Reserve Centers Vehicle Maintenance Facility**

<b>VMF Type</b>	<b>CCN</b>	<b>Type</b>	<b>Space (SF)</b>
<i>Select a type of VMF based on the Vehicle Maintenance Facility criteria. (See Table 17115-8(a) for space derivation data).</i>			
Combat Vehicle Maintenance Facility	214-10	Type A	1,653 SF
		Type B	2,603 SF
		Type C	4,603 SF
		Type D	4,403 SF
		Type E	5,303 SF
		Type F	6,350 SF
		Type G	6,953 SF
<b>VMF Type</b>	<b>CCN</b>	<b>Space Formula</b>	<b>Space (SF)</b>
Automotive Vehicle Maintenance Facility	214-20	___ # of Bays x 480 sqft/bay	___ SF

Table 17115-8(a) Derivation of Space Allowances for Table 17115-8

TYPE	SMALL BAYS		MEDIUM BAY		LUBE/PM BAY		LARGE BAY		GENERAL SPACE	MEZZANINE STORAGE	TOTAL (NET SF)
	# OF BAYS	SIZE	# OF BAYS	SIZE	# OF BAYS	SIZE	# OF BAYS	SIZE			
A	1	560	0	640	0	800	0	1,456	462	300	1,322
B	2	560	0	640	0	800	0	1,456	562	400	2,082
C	1	560	2	640	1	800	0	1,456	602	440	3,682
D	3	560	0	640	1	800	0	1,456	602	440	3,522
E	2	560	2	640	1	800	0	1,456	602	440	4,242
F	0	560	0	640	1	800	2	1,456	788	580	5,080
G	2	560	3	640	1	800	0	1,456	942	780	5,562

## Notes - Table 17115-8

- 1) Total square footages are interior, functional space requirements. For total useable square footages, add mezzanine storage requirements. Mezzanine storage is to be constructed with ladder/stair access and removable safety rails over offices, tool rooms and heads.
- 2) Total gross square footages include 25% for walls and circulation.
- 3) The Lube/Preventative Maintenance Bay should be a separate bay, ideally with an air compressor lift vice a hydraulic lift. This bay should not be an exposed pit due to environmental concerns.
- 4) The Automotive Vehicle Maintenance Facility (Cat-Code 214-20) shall be 480 gross square feet, or 16' by 40' as directed by the P-80.

**Table 17115-8(a) Derivation of Space Allowances for Table 17115-8 (cont'd)**

**TYPE A:** Facility will not normally be incorporated into Marine Reserve Centers because their limited size does not allow for flexibility. Function breakdown is as follows:

<b>SPACE</b>	<b>SIZE (SF)</b>
Maintenance Bays	560
Flammable Storage	64
Tool Room	110
Head	80
Office Space	110
Maintenance Publications	98
Mezzanine	300
<b>Total Useable Space</b>	<b>1,322</b>
<b>Gross Space</b>	<b>1,653</b>

**TYPE B:** Function breakdown is as follows:

<b>SPACE</b>	<b>SIZE (SF)</b>
Maintenance Bays	1,120
Flammable Storage	64
Tool Room	160
Head	100
Office Space	140
Maint Publications	98
Mezzanine	400
<b>Total Useable Space</b>	<b>2,082</b>
<b>Gross Space</b>	<b>2,603</b>

<b>Type B Units</b>
Infantry Co/Bn
Supply Co/Bn
Recon Co/Bn
Medical Co/Bn
Dental Co/Bn
H&S Co
MP Co



**Table 17115-8(a) Derivation of Space Allowances for Table 17115-8 (cont'd)**

**TYPE C:** At least one small and one medium bay will be drive through, cost and space permitting. An overhead crane should be installed for the following types of units: AAV Co/Bn, LAR Co/Bn, and Maintenance Co/Bn. Function breakdown is as follows:

SPACE	SIZE (SF)
Maintenance Bays	1,840
Lube/PM Bay	800
Flammable Storage	64
Tool Room	200
Head	100
Office Space	140
Maint Publications	98
Mezzanine	440
<b>Total Useable Space</b>	<b>3,682</b>
<b>Gross Space</b>	<b>4,603</b>

Type C Units
Engineer Co/Bn
AAV Co/Bn
LAV Co/Bn
Maint Co/Bn
LSB Co/Bn

**TYPE D:** At least two small bays will be drive through, cost and space permitting. Function breakdown is as follows:

SPACE	SIZE (SF)
Maintenance Bays	1,680
Lube/PM Bay	800
Flammable Storage	64
Tool Room	200
Head	100
Office Space	140
Maint Publications	98
Mezzanine	440
<b>Total Useable Space</b>	<b>3,522</b>
<b>Gross Space</b>	<b>4,403</b>

Type D Units
Artillery Btry/Bn
ANGLICO
Truck Co
TOW Co
Comm Co/Bn
LAAD Bn

**Table 17115-8(a) Derivation of Space Allowances for Table 17115-8 (cont'd)**

**TYPE E:** At least one small bay and one medium bay will be drive through, cost and space permitting. Function breakdown is as follows:

SPACE	SIZE (SF)
Maintenance Bays	2,400
Lube/PM Bay	800
Flammable Storage	64
Tool Room	200
Head	100
Office Space	140
Maint Publications	98
Mezzanine	440
<b>Total Useable Space</b>	<b>4,242</b>
<b>Gross Space</b>	<b>5,303</b>

Type E Units
LAAM Bn
Engineer Supt Co
Collocated Units

**TYPE F:** At least one large bay and one medium bay will be drive through, cost and space permitting. An overhead crane should be installed. Function breakdown is as follows:

SPACE	SIZE (SF)
Maintenance Bays	2912
Lube/PM Bay	800
Flammable Storage	64
Tool Room	300
Head	100
Office Space	180
Maint Publications	98
Tank Skirt Storage	46
Mezzanine	580
<b>Total Useable Space</b>	<b>5,080</b>
<b>Gross Space</b>	<b>6,350</b>

Type F Units
Tank Co

**Table 17115-8(a)**  
**Derivation of Space Allowances for Table 17115-8 (cont'd)**

**TYPE G:** At least one small and one medium bay will be drive through, cost and space permitting. Function breakdown is as follows:

SPACE	SIZE (SF)
Maintenance Bays	3,040
Lube/PM Bay	800
Flammable Storage	64
Tool Room	400
Head	100
Office Space	280
Maintenance Publications	98
Mezzanine	780
<b>Total Useable Space</b>	<b>5,562</b>
<b>Gross Space</b>	<b>6,953</b>

Type G Units
MWSS
Engineer Intensive Collocated Units

**Table 17115-9 Space Criteria for Marine Corps Reserve Centers  
Special Requirement Space Allowance**

<b>SPECIAL REQUIREMENTS –</b>					
<b>Special requirements are not included in all reserve centers, and are justified by a unit's particular mission.</b>					
<b>PART I (GROSS SQUARE FEET)</b>					
Each function must be approved by Headquarters, USMC and Commander, Marine Forces Reserve. Although these functions are located with the reserve center, for costing & scoping purposes they are not included in the 171-15 Category Code. Use appropriate Category Code unit cost. See "Derivation of Special Requirement Space Allowances for Table 17115-9" for space requirement derivation data.					
<b>Function</b>	<b>Cat. Code</b>		<b>Calculation</b>	<b>Scope</b>	<b>UOM</b>
Indoor Pistol Range	171-50			900	SF
Rappelling Tower	179-50			400	SF
Tank, Combat Training Pool	179-55			4,200	SF
Parachute and Survival Equipment Shop	211-75			3,670	SF
Optics Shop	213-50			500	SF
Carpenter Shop	213-56			800	SF
Boat Shop	213-58			2,400	SF
Scuba Locker	213-68			250	SF
Field Maintenance Shop (Comm/Elect)	217-30			3,700	SF
Instrument Calibration Shop	218-45			3,600	SF
Boat Storage Shed	441-35			1,700	SF
Vehicle Holding Shed	214-40	___ # of tactical vehicles	___ # of bays (one per 30 vehicles) x 800 SF/bay =	___	SF
Light Gun Shed	215-20		___ # of bays x 788 SF/bay =	___	SF
Organic Equipment Storage Shed	441-12			Variable	SF

**Table 17115-9 Space Criteria for Marine Corps Reserve Centers (continued)  
Special Requirement Space Allowance**

<b>SPECIAL REQUIREMENTS –</b>				
<b>Special requirements are not included in all reserve centers, and are justified by a unit's particular mission.</b>				
<b>PART II (GROSS SQUARE YARDS)</b>				
Each function must be approved by Headquarters, USMC and Commander, Marine Forces Reserve. Although these functions are located with the reserve center, for costing & scoping purposes they are not included in the 171-15 Category Code. Use appropriate Category Code unit cost. See "Derivation of Special Requirement Space Allowances for Table 17115-9" for space requirement derivation data.				
<b>Function</b>	<b>Cat. Code</b>	<b>Calculation</b>	<b>Scope</b>	<b>UOM</b>
Antennae Array	132-55		4,400	SY
Bulk Fuel Equipment Storage Shed	441-35		35	SY
Loading Ramp	851-15		35	SY
Vehicle Wash Platform	214-55	___ # of wash points x 90 SY/wash point =	___	SY
Tactical Vehicle Parking (Wheeled)	852-35	___ # of wheeled vehicles x 50 SY/vehicle =	___	SY
Tactical Vehicle Parking (Tracked)	852-35	___ # of tracked vehicles x 75 SY/vehicle =	___	SY
Private Owned Vehicle Parking	852-10	___ # of personnel x 35 SY/vehicle (provide a min. of 80%) =	___	SY
Quadcon Storage Pad	852-35	___ # of QUADCONS x 23 SY/QUADCON =	___	SY
HAZMAT Storage Pad	852-35	___ # of HAZMAT sheds x 23 SY/HAZMAT shed =	___	SY
MALS Van Pad	852-35	___ # of MALS vans x 34 SY/MALS van =	___	SY
Generator Storage Shed	441-35	___ # of generators x 5 SY/generator =	___	SY
Security Fencing	872-10		Variable	LF
Security fencing should be located, at a minimum, around the perimeter of the VMF, Tactical Vehicle Parking, Quad-Con Storage Lot, and Antennae Array, where applicable.				
Land	911-		10	AC

**Table 17115-9(a) Derivation of Special Requirement Space Allowances for Table 17115-9**

<b>PART I</b>		
Special requirements are not included in all reserve centers, and are justified by a unit's particular mission. Each function must be approved by Headquarters, USMC and Commander, Marine Forces Reserve.		
<b>Function</b>	<b>Cat. Code</b>	
Indoor Pistol Range	171-50	Fixed size (900 SF). For MP units only.
Rappelling Tower	179-50	Fixed size (400 SF)
Tank, Combat Training Pool	179-55	Fixed size (4,200 SF)
Parachute and Survival Equipment Shop	211-75	Fixed size (3,670 SF)
Optics Shop	213-50	Fixed size (500 SF). For units with special optical weapon system storage/maintenance requirements.
Carpenter Shop	213-56	Fixed size (800 SF)
Boat Shop	213-58	Fixed size (2,400 SF)
Scuba Locker	213-68	Fixed size (250 SF)
Vehicle Holding Shed	214-40	Variable size (1 bay at 800 gross SF for each 30 vehicles).
Light Gun Shed	215-20	Variable size (788 SF per bay). Multiply by number of bays required.
Field Maintenance Shop (Communications/Electronics)	217-30	Fixed size (3,700 SF). A separate structure with 200 SF of office space, 1,000 SF work area with tech benches, a head and vehicle access with roll-up door.
Instrument Calibration Shop	218-45	Fixed size (3,600 SF)
Organic Equipment Storage Facility	441-12	Based on 80% of unit's unique organic training allowance
Boat Storage Shed	441-35	Fixed size (1,700 SF)

**Table 17115-9(a) Derivation of Special Requirement Space Allowances for Table 17115-9 (cont'd)**

<b>PART II</b>		
Special requirements are not included in all reserve centers, and are justified by a unit's particular mission. Each function must be approved by Headquarters, USMC and Commander, Marine Forces Reserve.		
<b>Function</b>	<b>Cat. Code</b>	
Antennae Array	132-55	Fixed size (4,400 SY)
Vehicle Wash Platform	214-55	Variable size (800 SF per vehicle). Multiply by number vehicles washrack designed to accommodate.
Bulk Fuel Equipment Storage Shed	143-77	Fixed size (35 SY)
Quad Con Storage Lot	852-35	Variable size (23 SY per container)
HAZMAT Storage Pad	852-35	Variable size (23 SY per HAZMAT storage shed)
MALS Van Pad	852-35	Variable size (34 SY per van)
Generator Storage Shed	441-35	Variable size (5 SY per generator)
Loading Ramp	851-15	Fixed size (35 SY)
Tactical Vehicle Parking (Wheeled)	852-35	Variable size (50 SY per wheeled vehicle)
Tactical Vehicle Parking (Tracked)	852-35	Variable size (75 SY per tracked vehicle)
Private Owned Vehicle Parking	852-10	Variable size (35 SY per POV). Provide a minimum of parking for 80% of the drill strength
Security Fencing	872-10	Variable size around perimeter. Fencing required around VMF/tactical parking, Quad Con storage lot and antennae array, where applicable.
Land	911-	Minimum size (10 acres of useable land)

**171 17 TV CENTER FOR INSTRUCTIONAL MATTER (SF)****FAC: 1441****BFR Required: Y**

17117-1 **DEFINITION.** This facility may be provided only when specifically authorized by Naval Education and Training Command (NETC). Requirements will be determined for each individual case, with NETC guidance.

**171 20 APPLIED INSTRUCTION BUILDING (SF)****FAC: 1712****BFR Required: Y**

17120-1 **DEFINITION.** This facility provides for training personnel through the applied use of technical equipment and tools. Some of the characteristic features of applied instruction classrooms are:

- The use of drafting tables
- The use of workbenches to train personnel in trade/specialized skills such as electronics, machine tool operation, welding and similar.
- The use of operational training machinery such as automotive or other engines, refrigeration equipment, etc.
- The requirement for complete functional systems such as weapons delivery systems, fire control systems, etc.
- For planning purposes, applied instruction facilities can be divided into two general categories:
  - a. **General Applied Instruction Facilities** (for example, Service School Shops and Laboratories).
  - b. **Specialized Applied Instruction Facilities** (for example, Multiengine Patrol Plane Training Building).

17120-2 **PLANNING METHODOLOGY.** Facilities for each category must be planned separately because planning methodologies are different for each group. General applied instruction facilities have flexible space allowances and must be planned to individually suit the type of instruction to be accommodated. Specialized applied instruction facilities have fixed space allowances. In the following text, each category is discussed separately.

**17120-3 BROAD PLANNING FACTORS**



17120-3.1 **General Applied Instruction Facilities.** The gross SF building area (for BFR purposes) may be computed by either one of the two alternate methods:

- In the absence of detailed data or when close approximation to precise requirements is not considered necessary, the gross building area should be computed based on 150 gross square feet per student station.
- If specific personnel data is available follow the planning procedure and table given under Basic Category 171 and 171-20.

Figure 17120-1 provides a method to calculate floor area requirements for hands-on mockup training devices.

**Figure 17120-1  
Planning Formula for Determining Floor Requirements for  
Hands-on Mockup Space**

FORMULA:  $A = B (CD + E)$

DEFINITIONS

A = Area of classroom in net SF

B = Number of items of practice equipment required. This figure is obtained by dividing C into the average number of students in each class session.

C = Number of students assigned to each item of practice equipment.

D = Net SF of floor area required for one student working on an item of practice equipment.

E = Net SF of floor area occupied by one item of practice equipment. Includes clearances and aisles. Human engineering factors, including safety, must be considered. In cases where student working areas (item D) partially overlap equipment clearance areas, insure that the space requirements are not duplicated.

**17120-3.2 SPECIALIZED APPLIED INSTRUCTION FACILITIES.** This category includes facilities designed for training in specialized functions requiring a dedicated building. Space allowances are either fixed or given in gross SF per student and in every case includes all necessary support spaces, such as administration, lounges, training aid storage, library space, reproduction areas, learning centers, toilets, showers, locker rooms,

corridors, and janitorial space. For some of the facilities listed below which require a specific building configuration, definitive designs have been prepared. Those cases are annotated in the text.

- **Flight Training and Briefing Building.** This building provides space for student pilots in support of direct flight training. Included in the allowance is space for lecture rooms and classrooms, instructor pilot offices, ready rooms, flight planning rooms, briefing rooms, and other support space. The facility provides the necessary space for interaction of student and instructor in briefing and debriefing of actual training flight, singly or in groups. This space is over and above the space requirements for extensive classroom, instrument trainer or flight simulator training, which are covered in other category codes or in other sublistings under this category code. Also, this space is in addition to the normal squadron administrative space covered under category code 211 07. The planning factor for Flight Training and Briefing Building is 125 gross SF Per student, based on the average on-board student load.
- **Naval Air Maintenance Training Building.** Naval Air Maintenance Training Buildings provide the necessary classrooms and other space in support of one or more Maintenance Trainer Sets (MTS's). MTS's, consisting of instructional items as displays, actual systems/subsystems/equipment/parts/materials, cut-aways, mock-ups, audio/visual aids, provide maintenance personnel and pilots with technical training on aeronautical systems and associated equipment, organizational and intermediate maintenance, operation and special techniques as applied to aircraft subsystems, missiles and specific equipment and other training as the Chief of Naval Operations may direct.

17120-3.3 The planning factor for the Naval Air Maintenance Training Building is 160 gross SF per student. The number of students for planning purposes shall be the average on-board student loading.

17120-3.4 Highly sophisticated new weapon systems may require more space than-would be computed on the basis of 160 square feet per student. The facility or site study prepared for each new weapon system provides the necessary information for making such determination. When the maintenance training space requirement is found to exceed 160 square feet per student, the requirements shall be fully documented, to include data relative to size of trainers, students per trainer, support space requirements and other pertinent matters to enable evaluation of the actually required gross area.

- **Fleet Readiness Aviation Maintenance Personnel (FRAMP) and Aircrew Learning Center.** This facility provides classrooms, briefing rooms and environmentally protected FRAMP practical training work areas to

support initial and recurrent training for fleet aircrew (pilots, Naval Flight Officers, and when applicable, enlisted crew members) and aircraft maintenance personnel. Gross area requirements vary with model of aircraft and student loading and must be determined for each individual case. Although FRAMP and aircrew training facilities can be separate, integrated facilities permit efficient utilization of classrooms, study carrels, media reproduction and support areas and administrative spaces. Simulator facilities (code 171 35) may be attached to this building.

- **All Weather Training Building.** The all-weather training building provides the necessary space to house the special devices used by pilots, crewmen, and ground controllers to maintain their operating proficiency for adverse weather conditions. The planning factor for this facility is one (1) standard all-weather training building for an all-weather training station supporting two or more all-weather squadrons. The standard all-weather training building has an area of 7702 gross SF. The building contains six classrooms of about 600 square feet each to house special devices, a map-making room, support spaces and space for routine maintenance and equipment testing.
- **Multi-engine Patrol Plane (VP) Training Building.** This facility houses special devices and gear used by patrol pilots and crewmen to maintain proficiency in submarine search and detection, aircraft and missile detection, and the employment of counter-measures against enemy radar. The planning factor is one (1) standard multi-engine patrol plane training building for a patrol plane station with a mission for continuous support of two or more patrol squadrons. The facility has an area of 26,120 gross SF, and contains 23 classrooms (18 feet by 22 feet average size), support spaces, and a lecture-demonstration hall.
- **Aviation Physiological Training Building.** This building provides classroom and support space for implementation of the aviation physiology training syllabus. The syllabus pertains to aeromedical aspects of night vision, acceleration and deceleration forces, explosive decompression, oxygen equipment, pressure suits, survival, protective and safety equipment. The planning factor is one (1) aviation physiological training building for each station that will support four carrier air groups or the equivalent of one HAWK OF VAH jet aircraft. The building is planned with the concurrence of NAVMEDCOM. The size of the building is 15,000 gross SF.
- **Delivery Retaining Detachment Building.** This facility provides refresher training for teams that handle and maintain special weapons and for pilots and crews assigned special weapons missions. The planning

factor is one (1) delivery retraining detachment building for each air station supporting operational units with a special weapons capability. The building has an area of 1,590 gross SF.

- **Naval Construction Battalion Unit (CBU) Facility.** This facility provides a construction unit contingency augmentation capability to the Naval Construction Forces and assures unit and individual skill training essential to required readiness posture. Space requirements may be satisfied by a single or multiple building configuration. Facilities of this type will be planned only at locations designated by higher authority. Space allowances for CBU's are given in Table 17120-1
- **Band Practice Facility.** Table 17120-2 provides a summary list of the recommended areas for each of the spaces for both small and large bands. Local differences in operational patterns and function programs may require some modifications to the space program. These differences may, for example, include; larger or smaller size for individual spaces; different relationship patterns between spaces; or elimination or addition of specific spaces.
- **Combat Training Pool/Tank, Enclosed.** This facility provides an enclosed pool/tank for instruction in swimming and survival under combat conditions. It includes the pool and supporting spaces, such as locker room, instructional deck, mechanical room, etc., however the actual composition of individual facilities may vary according to their particular training requirements. Unique pool/tank design considerations may be required for specialized training facilities such as aviators' survival training tanks and EOD/underwater demolition training. For general planning criteria, See Category Code 179 55.

**Table 17120-1**  
**Space Criteria for Naval Construction Battalion Units**

Functional space	Notes	Gross Sq Ft	Gross Sq M
Administration		1,460	136
Engineering Lab		570	53
Locker/Showers	(3)	1,000	93
Classroom/Workbench		1,060	98
Classroom/Academic		580	54

Equipment Maintenance Shops	(1)	4,400	409
Vertical Shops (BU/SW/CE/UT)	(2)	4,000	372
Central Tool Room (CTR)	(2)	2,940	273
Project Material Storage (MLO)	(2)	2,540	236
Greens Issue/782 Issue	(2)	810	75
<b>TOTAL GROSS AREA</b>		19,360	1,799

Notes:

- (1) Based on three equipment repair bays.
- (2) Definition for the abbreviations used in this criterion are as follows:

BU = Builder  
 SW = Steelworker  
 CE = Construction Electrician  
 UT = Utilitiesman  
 CTR = Central Tool Room  
 MLO = Construction Project Material Storage (operated by the Materials Liaison Officer)  
 Greens/782 Issue = Organizational Clothing/Gear Issue

- (3) Total Gross Area includes both men and women.

**Table 17120-2  
Recommended Space Allocations for Navy Band Training Facilities**

Function-Space	Small Fleet Band (35 pieces)		Large Fleet Band (45 pieces) Or Large Fleet Band-Plus (60 pieces)	
	Approx. no. of spaces	Square Meters	Approx. no. of spaces	Square Meters
Main Rehearsal Room	1	146	1	211
Practice Rooms-Group				
Large Group	1	65	1	65
Small Group	1	28	2	30
Practice Rooms-Individual				
Large Individual	2-4	7-12 ea.	3-6	7-12 ea.
Small Individual	6-8	5-6 ea.	9-12	5-6 ea.
<b>Subtotal</b>	<b>8-10</b>	<b>77</b>	<b>12-15</b>	<b>106</b>
Recording/Audio Control Booth	1	23	1	23
Library	1	46	1	59
Offices (No. of persons)	9	109	13	157
Personal Support				
Individual Instructor Lockers	1	48	1	63
Instrument Cleaning	1	7	1	7
Day Area	1	59	1	80
Toilets/Lockers/Showers				
Men		82		112
Women		42		45
Officer's Toilet				

Function-Space	Small Fleet Band (35 pieces)		Large Fleet Band (45 pieces) Or Large Fleet Band-Plus (60 pieces)	
	Approx. no. of spaces	Square Meters	Approx. no. of spaces	Square Meters
Storage and Supply				
Unit Supply/Storage	1	93	1	121
Instrument Repair	1	9	1	9
Janitor's Closet	1	5	1	5
Transition				
Lobby	1	56	1	84
Circulation				
<b>Subtotal Indoor Space-Net Only</b>		895		1182
Circulation, Walls, etc. @25%		224		296
<b>Subtotal</b>		1119		1478
Mechanical Spaces @ 5%		56		74
<b>GROSS TOTAL (Rounded)</b>		1171		1552
Outdoor Spaces				
Drill Area	See CCN 179-60		See CCN 179-60	
Parking Area (1 space per band piece)	See CCN 852-10		See CCN 852-10	

171 21 DECONTAMINATION TRAINING FACILITY (DELETED)

FAC: 1712

BFR Required: Y

17121-1 This category code is deleted. Decontamination training areas are integral to the operational facilities they occupy and as such, are not a standalone facility.

**171 25 GENERAL PURPOSE AUDITORIUM (SF)**

**FAC: 7431**

**BFR Required: Y**

17125-1 **DEFINITION.** An auditorium may be authorized when required as an adjunct to training or other functions (except administration). The primary purpose of the auditorium is an assembly area for instruction and training. General purpose auditoriums will not be planned at an installation where a motion picture theater is authorized except where justified by special circumstances. Seating capacity of an auditorium is to be determined in each specific case and justification provided. The size of an auditorium shall be calculated based on 12 square feet per seat gross floor area or 9 square feet per seat net floor area (in cases where auditorium is a part of a multiple use building sharing common circulation and service spaces).

**171 30 PHYSICAL EDUCATION FACILITY (SF)**

**FAC: 1715**

**BFR Required: Y**

17130-1 **DEFINITION.** A building that houses physical education training facilities at the United States Naval Academy (USNA) at Annapolis, Maryland. These facilities are used for the fitness development program of instruction at the USNA. This CCN is for use only by the USNA.

17130-2 **GENERAL.** An engineering analysis is required to determine facility space allocations.



**171 35 OPERATIONAL TRAINER FACILITY (SF)****FAC: 1721****BFR Required: Y**

17135-1 **DEFINITION.** This category is assigned to training space which meets one or more of the following criteria:

17135-1.1 It houses large operational trainers, usually duplicating part or all of surface or air weapons system.

17135-1.2 It is specifically designed and sized for a trainer; has characteristics such as high ceiling height, large room dimensions, and removable exterior wall panels to facilitate servicing; it may also include special design features to satisfy stability requirements of visual systems, unique environmental control requirements (HVAC & filtering), loads associated with motion base(s), and abnormal power requirements.

17135-1.3 Actual space requirement is dictated by the size of the trainer rather than student loading.

*Examples of the type of trainers which should be categorized under this code area:*

- a. Weapons System Trainer/Flight Simulator.*
- b. Part-Task Trainer (air).*
- c. Cockpit Procedure Trainer.*
- d. Instrument Trainer.*
- f. Full scale models of ships boiler rooms.*
- g. Full scale mock-up of a Trident tube.*
- h. Full scale mock-up of a Tomahawk Launcher.*
- i. Large scale models of water basins for practice of berthing procedures.*
- e. Mock-ups of ships and submarines and their associated armament.*

17135-2 Space which houses small trainers, such as radios, etc., is not categorized under this code, even though the trainers are operational. Use Category Code 171 20.

As space for operational trainers may occur as either a separate facility or as a wing or room of an applied instruction building, the following method of assigning the appropriate category code shall be used.

17135-3 In the case of a building to be used solely for the housing of a trainer and its required support space, the entire building shall be categorized as Category Code 171 35. The support space includes corridors, storage, briefing rooms, offices, mechanical room, and the like.

17135-4 If an operational trainer is included as part of a larger instruction building, the room housing the trainer shall be categorized as Category Code 171 35. This Category Code also includes support spaces for the trainer, including storage, briefing room equipment, and repair room. If any of the support spaces are used jointly for the operation of the trainer and the instruction given in the rest of the building, the support space shall be given the category assigned to the building, usually Category Code 171 20.

17135-5 Planning factors are given for a limited number of operational trainer facilities. Others will be added as they are developed. Where planning factors are not available, space requirements must be fully justified by and Engineering Evaluation. Room sizes, size of trainers, and support space should be listed, and the justification should be accompanied by drawings.

17135-6 Flight Simulator Space. This facility houses the Flight Simulator/Weapon System Trainer (WST) and associated Part Task Trainers (PTT). It is planned for stations supporting naval aircraft and is sized depending on aircraft type and average number of squadrons on-board. The total number of organizational units permanently assigned plus the average number of organizational units of rotational and special aircraft on-board shall be used for planning. Table 171-35A provides information on the gross areas required. The 6,000-square-foot area for example, will contain the following basic components:

- Trainer Room. An air-conditioned room of 50 by 50 feet minimum size, to house the necessary equipment of one (1) Weapon System Trainer (WST).
- Briefing Room. A classroom to house a maximum class of 20 pilots at 20 square feet per man.
- Administration. Office space for the officer-in-charge and two assistants.
- Maintenance Shop. A 20- by 15-foot space for the periodic maintenance of the test equipment.

- Mechanical and Electrical Equipment Room. Space of about 15 by 20 feet for the heating, air conditioning, and electrical distribution panels.
- Part Task Trainer Rooms. A minimum of two rooms of 20 by 20 feet for the housing of two Part Task Trainers (PTT).
- The other sizes will have similar requirements.

**Table 17135-1  
Flight Simulator Trainer Space Requirements**

Type of Squadron	Number of Squadrons	Number of Trainers	Gross Area (Sq Ft)
VA/VF/HS/HM	2 - 8	1-WST, 2-PTT	6,000
	9 - 15	2-WST, 2-PTT	7,500
VA/VP	1 - 4 (VS)	1-WST, 2-PTT	9,000
	1 - 2 (VP)		
VS/VP	5 - 8 (VS)	2-WST, 4-PTT	12,000
	3 - 5 (VP)		

17135-7 **Instrument Trainer Space.** This facility houses instrument trainers and cockpit procedure trainers. The size of this facility is based upon the number and type of aircraft squadrons or attack carrier air wings (CVW). Table 17135-2 provides information on the gross area requirements. Included is space for: administrative office, briefing room, technical order library, storage room, equipment maintenance shop, mechanical equipment room, and trainer room. In using Table 17135-2, the total number of permanently assigned organizational units on-board shall be counted.

**Table 17135-2  
Basic Instrument Trainer Space Requirements**

Type of Unit	Number of Units	Gross Area (Sq Ft)
VP, VS, or AEW squadron	1 squadron	5,000
	2 squadrons	8,000
CVW of VF/VA/HS/HM	1 or 2 wings	5,000
	3 or 4 wings	8,000

**171 36 RADAR SIMULATOR FACILITY (SF)**

**FAC: 1724**

**BFR Required: Y**

**17136-1 AUTHORIZATION.** This facility may be provided only when specifically authorized by Naval Education and Training Command (NETC). Requirements will be determined for each individual case, with NETC guidance.

**171 40 DRILL HALL (SF)**

**FAC: 1714**

**BFR Required: Y**

**17140-1 JUSTIFICATION.** Need for this facility must be determined on an individual basis and requires specific justification; this code is generally intended for inventory purposes.

**171 45 MOCK-UP AND TRAINING AID PREPARATION CENTER (SF)****FAC: 1732****BFR Required: Y**

17145-1 **AUTHORIZATION.** This facility may be provided only when specifically authorized by Naval Education and Training Command (NETC). Requirements will be determined for each individual case, with NETC guidance.

**171 50 SMALL ARMS RANGE - INDOORS (SF)****FAC: 1718****BFR Required: Y**

17150-1 **DEFINITION.** An indoor small arms range provides training space for the use of pistols and small caliber (22) rifles. Ranges will be used by all services on a joint basis when feasible, and they must be of sufficient size and capacity to provide continual training and retraining for all military personnel that require weapons training/qualification.

17150-2 The capacity of existing ranges or new requirements can be determined by:

1. Identifying the number of personnel to be trained.
2. Establish the number and size of training sessions.
3. Determine the number of hours per session and schedule training over an annual basis.
4. Calculate the required number of firing points based upon efficient arrangement of the size and schedules of the training groups.

17150-3 Indoor ranges are generally planned at locations where prevailing weather conditions seriously interfere with the scheduling of training. Otherwise, plan for outdoor ranges (Category Code 179 40).

For indoor range design criteria, refer to UFC 4-179-02.

**171 60 RECRUIT PROCESSING BUILDING (SF)****FAC: 6100****BFR Required: Y**

17160-1 **DEFINITION.** A recruit processing building is a facility for receiving, examining, and outfitting recruits. The processing building must provide space for the complete orientation, examination, and processing (medical, dental, supply, administrative) of all newly inducted and recruited personnel. The size of the facility will be determined by an engineering survey.

**171 77 TRAINING MATERIAL STORAGE (READY ISSUE / SHOP STORES / MISC) (SF)****FAC: 1732****BFR Required: Y**

17177-1 **DEFINITION.** Storage facilities for miscellaneous goods or equipment related to training facility support will be provided only where it can be individually justified. There are no criteria for this type of facility. General information on storage parameters is provided in Category Code series 440.

**172 30 GAS CHAMBER (SF)****FAC: 1723****BFR Required: Y**

17230-1 **DEFINITION.** A gas chamber is a building used for training personnel in the use of protective masks and the effects of chemical warfare.

**173 10 RANGE OPERATIONS BUILDING (SF)****FAC: 1731****BFR Required: Y**

17310-1 **DEFINITION.** Range Operations Buildings are designed for direct support to range operations. Such buildings can support a variety of operations for a firing range, such as: range operations, administrative support, target

storage and issue, equipment storage and maintenance, and ammunition breakdown and distribution (not storage). This category includes buildings associated with range operations such as range operations centers, operations/storage buildings, and ammo breakdown buildings (not ammunition storage). This Category Code is for buildings only; report structures used for these purposes as Category Code 173 30, Covered Training Area.

**173 11 RANGE SUPPORT BUILDING (SF)****FAC: 1731****BFR Required: Y**

17311-1 **DEFINITION.** A Range Support Building would be a building which houses support functions conducted at the range complex, but not covered elsewhere. This includes range billets, classroom space at a range, buildings to conduct after action reviews, and all other range support activities with the exception of activities described in Range Operations Building (Category Code 173 10), Weapons Range Observation Tower (Category Code 179 35), and Public Toilet (Category Code 730 75). This Category Code is for buildings only; structures used for this purpose should be reported as Category Code 17330, Covered Training Area.

**173 20 TRAINING AIDS CENTER (SF)****FAC: 1732****BFR Required: Y**

17320-1 **DEFINITION.** A Training Aids Center is a building that is used to fabricate, maintain, store, and issue training devices and materials including Multiple Integrated Laser Equipment System (MILES) and visual information (VI) aids; it also provides the administrative space for the training support division (TSD) management staff.

**173 30 COVERED TRAINING AREA (SF)****FAC: 1733****BFR Required: Y**

17330-1 **DEFINITION.** Covered Training Areas are structures which provide a covered area to support and conduct training or for feeding of personnel on a training facility while providing protection for equipment and personnel from the

elements. Typically, the sides of the structure are open with a solid roof. This category also includes structures that support range operations. These facilities are usually located in ranges, training areas, bivouac, or maneuver areas. Square footage is measured as the area under the room or cover. Also this Category Code is used to report covered physical training areas and covered martial arts training areas.

**173-40 OBSERVATION TOWER/BUNKER (SF)****FAC: 1783****BFR Required: Y**

17412-1 **DEFINITION.** An Observation Tower/Bunker is a protective shelter used at Navy/Marine Corps EOD ranges for the protection of EOD technicians and observers. Location of the Tower/Bunker must be IAW NAVSEA OP-5. An Engineering Evaluation must be conducted to determine the correct size of the facility.

**174 10 MANEUVER/TRAINING AREA, LIGHT FORCES (AC)****FAC: 1741****BFR Required: N**

17410-1 **DEFINITION.** This category includes all space for ground and air combat forces to practice movements and tactics. Different types of units may support one another (combined arms), or a unit may operate independently. The "light" designation refers to areas where maneuver is restricted to only small units or units having only wheeled vehicles. "Light" maneuver/training areas are not typically used by "heavy" or mechanized forces, other than in assembly areas where movement is restricted to roads or trails. Included in this category are bivouac sites, base camps, and other miscellaneous training areas. Account for each area, typically managed and scheduled by a range name or code through the installation training or range control manager with a separate facility number and individual real property record. When maneuver/training areas can be used for multiple purposes, priority of assignment is Maneuver/Training Area, Amphibious; Maneuver/Training Area, Heavy; Maneuver/Training Area, Light.



**174 11 MANEUVER/TRAINING AREA, AMPHIBIOUS FORCES (AC)****FAC: 1741****BFR Required: N**

17411-1 **DEFINITION.** This category includes all space for ground and air combat forces to practice movements and tactics during amphibious (ship-to-shore) operations. Different types of units may work in support of one another (combined arms), or the units may operate independently. Tasks can include both combat and logistics (especially logistics over the shore (LOTS)). This category also includes areas with bivouac sites, base camps, and other miscellaneous training areas. Account for each area, typically managed and scheduled by a range name or code through the installation training or range control manager, with a separate facility number and individual real property record. When maneuver/training areas can be used for multiple purposes, priority of assignment is Maneuver/Training Area, Amphibious; Maneuver/Training Area, Heavy; Maneuver/Training Area, Light.

**174 12 LAND NAVIGATION COURSE (AC)****FAC: 1741****BFR Required: N**

17412-1 **DEFINITION.** A Land Navigation Course is an area located within the training complex which is principally scheduled and used for map reading, terrain association, or navigational training.

**174 13 FIELD TRAINING AREA (AC)****FAC: 1741****BFR Required: N**

17413-1 **DEFINITION.** A Field Training Area is a specific area that is intended for the training of personnel or animals in a field environment that cannot be categorized by the other Category Codes in the 174 basic series. Training conducted in such an area may include medical, K-9, or communications equipment. Maneuver land shall not be included in this category; separately classify maneuver in other Category Codes within the 173 basic series.

**174 20 MANEUVER/TRAINING AREA, HEAVY FORCES (AC)****FAC: 1742****BFR Required: N**

17420-1 **DEFINITION.** This category includes all space for ground and air combat forces to practice movements and tactics. Different types of units may support one another (combined arms), or may operate independently. The “heavy” designation refers to areas where maneuver is unrestricted and can consist of all types of vehicles and equipment, including tracked vehicles. “Heavy” maneuver/training areas can be used by “light” forces. This category includes bivouac sites, base camps, and other miscellaneous training areas. This area is typically managed and scheduled by a range name or code through the installation training or range control manager, and is accounted for with a separate facility number and individual real property record. When maneuver/training areas can be used for multiple purposes, priority of assignment is Maneuver/Training Area, Amphibious; Maneuver/Training Area, Heavy; Maneuver/Training Area, Light.

**174 30 IMPACT AREA DUDDDED (AC)****FAC: 1743****BFR Required: N**

17430-1 **DEFINITION.** An area having designated boundaries within which all ordnance will detonate or impact shall be categorized as Impact Area Duddded. This area includes all impact areas that do not contain automated targets or targets classified as real property. Vehicle bodies are sometimes placed in the area to act as targets for artillery direct and indirect fire. The primary function of the impact area is to contain weapons effects as much as possible using earthen berms or natural terrain features. Assume the impact areas contain unexploded ordnance and may not be used for maneuver. This area is typically managed and scheduled by a range name or code through the installation training or range control manager, and is accounted for with a separate facility number and individual real property record.

**174 31 IMPACT AREA NON-DUDDER (AC)****FAC: 1743****BFR Required: N**

17431-1 **DEFINITION.** An area having designated boundaries within which ordnance that does not produce duds will impact is an Impact Area Non-Dudded. This area is composed mostly of the safety fans for small arms ranges. This area includes all impact areas that do not contain automated targets or targets classified as real property. The primary function of the impact area is to contain weapons effects as much as possible using earthen berms or natural terrain features. A separate facility number and individual real property record shall be issued to account for each area that should be managed and scheduled by a range name or code through the installation training or range control manager. Although these impact areas may be used for maneuver, when the weapons ranges are not in use, they will remain categorized as impact areas.

**174 40 PERSONNEL/EQUIPMENT DROP ZONE (AC)****FAC: 1744****BFR Required: N**

17440-1 **DEFINITION.** A large, flat, cleared area for personnel and equipment to land following a parachute jump shall be categorized as a Personnel/Equipment Drop Zone.

**175 01 AUTOMATIC RIFLE RANGE (AC)****FAC: 1750****BFR Required: Y**

17501-1 **DEFINITION.** The Automatic Rifle Range is designed for training target engagement techniques with rifles and squad automatic weapon (SAW). This range is used to train personnel on the skills necessary to employ automatic and semi-automatic firing techniques. Within this range targets are not fully automated and the scenarios are not computer driven or scored. This Category Code will not be used for ranges where the principal use is defined in other Category Codes within the 175 series.

**175 02 NON-STANDARD SMALL ARMS RANGE (AC)****FAC: 1750****BFR Required: Y**

17502-1 **DEFINITION.** The Non-Standard Small Arms Range is designed for training requirements that are not associated with current published doctrine, but fall within a commander's training requirements. This range includes all small arms ranges that do not fit into other categories. Targets in this range are not fully automated and/or the scenarios are not computer driven or scored. This Category Code number includes dedicated dry fire areas.

**175 10 BASIC 10M-25M FIRING RANGE (ZERO) (AC)****FAC: 1751****BFR Required: Y**

17510-1 **DEFINITION.** A Basic Zero Firing Range is designed for training shot-grouping and zeroing exercises with rifles and machine guns. This range is used to train individual personnel on the skills necessary to align the sights and practice basic marksmanship techniques against stationary targets. This range requires no automation.

**175 20 AUTOMATED FIELD FIRE (AFF) RANGE (AC)****FAC: 1752****BFR Required: Y**

17520-1 **DEFINITION.** An Automate Field Fire Range is designed for training target engagement techniques with rifles. This range is used to train and familiarize personnel on the skills necessary to identify, engage, and hit stationary infantry targets. All targets are fully automated and in the event specific target scenario is computer driven and scored from the range operations center.

**175 30 RECORD FIRE RANGE, NON-AUTOMATED (AC)****FAC: 1753****BFR Required: Y**

17530-1 **DEFINITION.** A Record Fire Range is designed for training and day/night qualification requirements with rifles. This range is used to train and test personnel on the skills necessary to identify, engage, and hit stationary infantry targets. Targets are not fully automated and/or the scenarios are not computer driven or scored. This Category Code will not be used for Known-Distance (KD) Ranges, which are accounted for under Category Codes 175 50 and 175 70.

**175 31 AUTOMATED RECORD FIRE (ARF) RANGE (AC)****FAC: 1753****BFR Required: Y**

17531-1 **DEFINITION.** An Automated Record Fire Range is designed for training and day/night qualification requirements with rifles. This range is used to train and test personnel on the skills necessary to identify, engage, and hit stationary infantry targets. All targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center. This category code number will not be used for Known-Distance (KD) Ranges, which are accounted for under Category Codes 175 50 and 175 70.

**175 32 MODIFIED RECORD FIRE RANGE (AC)****FAC: 1753****BFR Required: Y**

17532-1 **DEFINITION.** A Modified Record Fire Range is designed for training and day/night qualification with rifles. This range combines the capabilities of 1752X, Automated Field Fire (AFF) Range; and 1753, Automated Record Fire (ARF) Range to reduce land and maintenance requirements. All targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center. This Category Code Number will not be used for Known-Distance (KD) Ranges, which are accounted for under Category Codes 175 50 and 175 70.

**175 50 RIFLE KNOWN DISTANCE (KD) RANGE (AC)****FAC: 1755****BFR Required: Y**

17550-1 **DEFINITION.** A Rifle Known Distance Range is designed for training rifle marksmanship and target engagement techniques. This range is used to train personnel on the skills necessary to identify, engage, and hit stationary targets in a static array from a known distance.

**175 60 SNIPER FIELD FIRE RANGE (AC)****FAC: 1756****BFR Required: Y**

17560-1 **DEFINITION.** A Sniper Field Fire Range is designed to meet training and qualification requirements with the sniper rifle. This range is used to train and test snipers on the skills necessary to detect, identify, engage, and hit stationary and moving infantry targets in a tactical array in accordance with applicable field manuals. In this range targets are not fully automated and/or the scenarios are not computer driven or scored.

**175 61 AUTOMATED SNIPER FIELD FIRE RANGE (AC)****FAC: 1756****BFR Required: Y**

17561-1 **DEFINITION.** An Automated Sniper Field Fire Range is designed to meet the training and qualification requirements with the sniper rifle. This range is used to train and test snipers on the skills necessary to detect, identify, engage, and hit stationary and moving infantry targets in a tactical array in accordance with applicable field manuals. All targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center.

**175 70 PISTOL KNOWN DISTANCE (KD) RANGE (AC)****FAC: 1757****BFR Required: Y**

17570-1 **DEFINITION.** A Pistol Known Distance (KD) Range is designed for training pistol and revolver marksmanship and target engagement techniques. This range is used to train personnel on the skills necessary to identify, engage, and hit stationary targets in a static array from a known distance.

**175 71 COMBAT PISTOL/MP FIREARMS QUALIFICATION COURSE (AC)****FAC: 1757****BFR Required: Y**

17571-1 **DEFINITION.** A Combat Pistol/MP Firearms Qualification Course is a range designed to meet training and qualification requirements with combat pistols and revolvers. This range is used to train and test personnel on the skills necessary to identify, engage, and hit stationary infantry targets. In this range targets are not fully automated and/or the scenarios are not computer driven or scored.

**175 72 AUTOMATED COMBAT PISTOL/MP FIREARMS QUALIFICATION COURSE (AC)****FAC: 1757****BFR Required: Y**

17572-1 **DEFINITION.** An Automated Combat Pistol/MP Firearms Qualification Course is a range designed to meet training and qualification requirements with combat pistols and revolvers. This range is used to train and test personnel on the skills necessary to identify, engage, and hit stationary infantry targets. All CPQC targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center.

**175 73 SUBMACHINE GUN RANGE (AC)****FAC: 1757****BFR Required: Y**

17573-1 **DEFINITION.** A Submachine Gun Range is designed for training target engagement techniques with the submachine gun. This range is used to train personnel on the skills necessary to identify, engage, and hit stationary infantry targets. Targets are not fully automated and/or the scenarios are not computer driven or scored within this range.

**175 80 MACHINE GUN TRANSITION RANGE (AC)****FAC: 1758****BFR Required: Y**

17580-1 **DEFINITION.** A Machine Gun Transition Range is designed to meet the training requirements with machine guns. This range is used to train personnel on the skills necessary to identify, engage, and hit stationary infantry targets at known distances. Targets within this range are not fully automated and/or the scenarios are not computer driven or scored. Ranges that fulfill purpose of both Machine Gun Transition Range (Category Code 175 80) and Machine Gun Field Fire Range (Category Code 175 81) will be carried as Machine Gun Field Fire Range (Category Code 175 81).

**175 81 MACHINE GUN FIELD FIRE RANGE (AC)****FAC: 1758****BFR Required: Y**

17581-1 **DEFINITION.** A Machine Gun Field Fire Range is designed to train target engagement techniques with squad assault weapons and machine guns. This range is used to train personnel on the skills necessary to identify, engage, and hit stationary infantry, vehicle, and bunker type targets. Distance to targets is not predetermined. Within this range targets are not fully automated and/or the scenarios are not computer driven or scored. Ranges that fulfill purpose of both Machine Gun Transition Range (Category Code 175 80) and Machine Gun Field Fire Range (Category Code 175 81) will be carried as Machine Gun Field Fire Range (Category Code 175 81).



**175 82 AUTOMATED MULTIPURPOSE MACHINE GUN (MPMG) RANGE (AC)****FAC: 1758****BFR Required: Y**

17582-1 **DEFINITION.** An Automated Multipurpose Machine Gun (MPMG) Range is designed for zeroing, training, and qualification requirements with squad assault weapons (SAW) and machine guns. This range is used to train personnel on the skills necessary to identify, engage, and hit stationary infantry targets. All targets within this range are fully automated and the event specific target scenario is computer driven and scored from the range operations center.

**176 10 GRENADE LAUNCHER RANGE (AC)****FAC: 1761****BFR Required: Y**

17610-1 **DEFINITION.** A Grenade Launcher Range is designed to meet training and qualification requirements of the 40mm M203 Grenade Launcher. This range is used to train and test personnel on the skills necessary to engage and defeat stationary target emplacements with the 40mm Grenade Launcher. No automation is required for this facility. Count FP as each collection of points or lanes that allow completion of all training objectives.

**176 20 40MM (GRENADE) MACHINE GUN QUALIFICATION RANGE (AC)****FAC: 1762****BFR Required: Y**

17620-1 **DEFINITION.** A 40MM Machine Gun Qualification Range is designed to conduct training qualification firing with the grenade machine gun (e.g., MK-19). This range is used to train personnel with the weapon either ground or vehicle mounted. Targets in this range may be either non-automated or fully automated and the event specific target scenario is computer driven and scored from the range operations center. A lane is defined as the area for one gunner/weapon system to complete the training objectives.

**176 30 LIGHT ANTIARMOR WEAPONS RANGE SUBCALIBER (AC)****FAC: 1763****BFR Required: Y**

17630-1 **DEFINITION.** A Light Anti-armor weapons range is designed for training target engagement techniques with light anti-armor weapons (e.g., LAW/AT-4). This range is used to train personnel on the skills necessary to employ the weapon and hit stationary and moving targets using a sub-caliber training device. Targets are not fully automated and/or the scenarios are not computer driven or scored. Ranges used for both live and sub caliber firing will be carried under the Light Anti-armor Weapons Range Live (Category Code 176 31).

**176 31 LIGHT ANTIARMOR WEAPONS RANGE LIVE (AC)****FAC: 1763****BFR Required: Y**

17631-1 **DEFINITION.** A Light Anti-armor Weapons Range Live is designed for training target engagement techniques with light anti-armor weapons (e.g., LAW/ AT-4). This range is used to train personnel on the skills necessary to employ the weapon and hit stationary and moving targets using live rockets or a sub-caliber training device. Targets are not fully automated and/or the scenarios are not computer driven or scored. Ranges used for both live and sub-caliber firing will be carried under this Category Code.

**176 40 ANTIARMOR TRACKING AND LIVE-FIRE RANGE (AC)****FAC: 1764****BFR Required: Y**

17640-1 **DEFINITION.** An Anti-armor Tracking and Live-Fire Range is a complex designed to meet training and qualification requirements with medium and heavy anti-armor weapons systems (e.g., Javelin, TOW, SMAW). This complex is used to train and test soldiers on the skills necessary to employ the weapon, identify, track, engage, and defeat stationary and moving armor targets presented individually or as part of a tactical array. In this complex targets are not fully automated and/or the scenarios are not computer driven or scored. One lane is designed to accommodate up to 10 gunners/weapons.

**176 41 AUTOMATED ANTIARMOR TRACKING AND LIVE-FIRE RANGE (AC)****FAC: 1764****BFR Required: Y**

17641-1 **DEFINITION.** An Automated Anti-armor Tracking and Live-Fire Range is a complex designed to meet training and qualification requirements with medium and heavy anti-armor weapons systems (e.g., Javelin, TOW, SMAW). This complex is used to train and test personnel on the skills necessary to employ the weapon, identify, track, engage, and defeat stationary and moving armor targets presented individually or as part of a tactical array. All targets within this range are fully automated, computer driven, and scored from the range operations center. One lane is designed to accommodate up to 10 gunners/weapons.

**176 50 FIELD ARTILLERY DIRECT FIRE RANGE (AC)****FAC: 1765****BFR Required: Y**

17650-1 **DEFINITION.** A Field Artillery Direct Fire Range is designed to meet training requirements of field artillery crews. This range is used to train field artillery crews on the skills necessary to employ direct fire gunnery techniques with indirect fire equipment against stationary targets in a tactical array using live direct fire artillery. No automation is required for this facility. EA is defined as the range area to support up to one battery of artillery.

**176 60 TANK/FIGHTING VEHICLE STATIONARY GUNNERY RANGE (AC)****FAC: 1766****BFR Required: Y**

17660-1 **DEFINITION.** A Tank/Fighting Vehicle Stationary Gunnery Range is designed for conducting weapons system bore sighting, screening, zeroing and/or harmonization. Armor, infantry and/or aviation crew use this range. Within this range targets may be fully automated and/or scored from the range operations center. EA is defined as the range area to support up to 15 guns.

**176 70 MORTAR RANGE (AC)****FAC: 1767****BFR Required: N**

17670-1 **DEFINITION.** A Mortar Range is designed to meet the training requirements of mortar crewmen. This range is used to train mortar crews on the skills necessary to apply fire mission data, engage, and hit stationary targets in a tactical array using live fire mortars. No automation is required for this facility. EA is defined as the range area to support up to the mortar section.

**176 71 FIELD ARTILLERY INDIRECT FIRE RANGE (AC)****FAC: 1767****BFR Required: N**

17671-1 **DEFINITION.** A Field Artillery Indirect Fire Range is designed to meet the training and qualification requirements of field artillery units. This range is used to train field artillery crews on the skills necessary to apply fire mission data, engage, and hit stationary targets in a tactical array with indirect fire. No automation is required for this facility. EA is defined as the range area to support up to one battery of artillery.

**176 80 MORTAR SCALED RANGE (AC)****FAC: 1768****BFR Required: Y**

17680-1 **DEFINITION.** A Mortar Scaled Range is designed to meet the training requirements of mortar crewmen. This range is used to train mortar crews on the skills necessary to apply fire mission data, engage, and hit stationary targets in a tactical array using sub-caliber training devices. No automation is required for this facility. EA is defined as the range area to support up to three mortars.

**176 81 FIELD ARTILLERY SCALED RANGE (AC)****FAC: 1768****BFR Required: Y**

17681-1 **DEFINITION.** A Field Artillery Scaled Range is designed to meet training requirements of field artillery crews. This range is used to train field artillery crews on the skills necessary to apply fire mission data, engage, and hit stationary targets in a tactical array using sub-caliber training devices. No automation is required for this facility. EA is defined as the range area to support up to three artillery pieces.

**176 90 SCALED GUNNERY RANGE (1:30 AND 1:60) (AC)****FAC: 1769****BFR Required: Y**

17690-1 **DEFINITION.** A Scaled Gunnery Range (1:30 and 1:60) is designed to meet training requirements of armor crews. This range is used to train armor crews on the skills necessary to detect, identify, engage, and hit stationary and moving scaled targets in a tactical array using sub-caliber training devices. No automation is required for this facility. No standard facilities are associated with this range. EA is defined as a range designed to handle 4 vehicles.

**176 91 SCALED GUNNERY RANGE (1:5 AND 1:10)****FAC: 1769****BFR Required: Y**

17691-1 **DEFINITION.** A Scaled Gunnery Range (1:50 and 1:10) is designed to meet training requirements of armor and infantry crews. This range is used to train armor and infantry crews on the skills necessary to detect, identify, engage, and hit stationary and moving scaled targets in a tactical array using sub-caliber training devices and/or simulations. All targets are fully automated, computer driven, and scored from the range operations center. EA is defined as a range designed to handle 4 vehicles.

**177 10 MULTIPURPOSE TRAINING RANGE (AC)****FAC: 1771****BFR Required: Y**

17710-1 **DEFINITION.** A Multipurpose Training Range is designed to meet the training and qualification requirements for the crews, teams and sections of combat units. This range is used to train and test armor, infantry, and aviation crews and sections on the skills necessary to detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. Targets are not fully automated and/or the scenarios are not computer driven or scored. LN is defined as a range to support training for 2 vehicles.

**177 11 AUTOMATED MULTIPURPOSE TRAINING RANGE (AC)****FAC: 1771****BFR Required: Y**

17711-1 **DEFINITION.** An Automated Multipurpose Training Range is specifically designed to satisfy the training and qualification requirements for the crews, teams and sections of combat units. This range supports dismounted infantry squad tactical live-fire operations either independently of, or simultaneously with supporting vehicles. This range is used to train and test armor, infantry, and aviation teams, crews and sections on the skills necessary to detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. All targets are fully automated and the event specific targets scenario is computer driven and scored from the range operations center. LN is defined as a range to support training for 2 vehicles.

**177 20 TANK/FIGHTING VEHICLE PLATOON BATTLE RUN (AC)****FAC: 1772****BFR Required: Y**

17720-1 **DEFINITION.** A Tank/Fighting Vehicle Platoon Battle Run is designed to meet the training and qualification requirements for platoons of armor and infantry units. This range is used to train and test armor and infantry platoons and sections on the skills necessary to detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. Targets are not fully automated and/or the scenarios are not computer driven or scored. EA is defined as a range area to support training of platoon-sized units up to six vehicles.

**177 21 TANK/FIGHTING VEHICLE MULTIPURPOSE RANGE COMPLEX, LIGHT, AUTOMATED (AC)****FAC: 1772****BFR Required: Y**

17721-1 **DEFINITION.** A Tank/Fighting Vehicle Multipurpose Range Complex, Light, Automated, is a complex designed to meet the training and qualification requirements for platoons of light and mechanized infantry, armor, and aviation units. This complex is used to train and test infantry, armor, and aviation platoons, sections, teams and crews on the skills necessary to detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. All targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center. EA is defined as a range area to support training of platoon-sized units up to six vehicles.

**177 22 TANK/FIGHTING VEHICLE MULTIPURPOSE RANGE COMPLEX, HEAVY, AUTOMATED (AC)****FAC: 1772****BFR Required: Y**

17722-1 **DEFINITION.** A Tank/Fighting Vehicle Multipurpose Range Complex, Heavy, Automated, is a complex specifically designed to satisfy the training and qualification requirements for the crews and platoons of armor, infantry and aviation units. This complex supports dismounted infantry squad tactical live-fire operations either independently of, or simultaneously with supporting vehicles. This range is used to train and test armor, infantry, and aviation platoons, sections, teams and crews on the skills necessary to detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. All targets are fully automated and the event specific targets scenario is computer driven and scored from the range operations center. When range can be used for both heavy and light purposes, it will be classified under this Category Code. EA is defined as a range area to support training of platoon-sized units up to six vehicles.

**177 30 FIRE AND MOVEMENT RANGE (AC)****FAC: 1773****BFR Required: Y**

17730-1 **DEFINITION.** A Fire and Movement Range is designed for training individual and buddy/team fire and movement techniques. The team negotiates maneuver utilizing cover and concealment techniques. Targets are not fully automated and/or the scenarios are not computer driven or scored. LN is defined as the path or trails to support training for two persons.

**177 40 SQUAD DEFENSE RANGE (AC)****FAC: 1774****BFR Required: Y**

17740-1 **DEFINITION.** A Squad Defense Range is designed for training individuals and squads on defensive engagement techniques and mutually supporting fires. This range is used to train personnel on the skills necessary to designate sectors of fire, identify, and provide suppressive fire on stationary infantry targets. All targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center. EA is defined as a range area to support training for a squad-sized unit.

**177 50 INFANTRY SQUAD BATTLE COURSE (AC)****FAC: 1775****BFR Required: Y**

17750-1 **DEFINITION.** An Infantry Squad Battle Course is designed for the training and qualification requirements of teams and squads on individual and collective tactics, techniques, and procedures and employment in tactical situations. This complex is used to train and test teams and squads on the skills necessary to conduct tactical movement techniques, detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. Targets are not fully automated and/or the scenarios are not computer driven or scored. EA is defined as a range area to support training of squad and platoon sized units.



**177 51 AUTOMATED INFANTRY SQUAD BATTLE COURSE (AC)****FAC: 1775****BFR Required: Y**

17751-1 **DEFINITION.** An Automated Infantry Squad Battle Course is designed for the training and qualification requirements of teams and squads on individual and collective tactics, techniques and procedures and employment in tactical situations. This complex is used to train and test teams and squads on the skills necessary to conduct tactical movement techniques, detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. All targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center. EA is defined as a range area to support training of squad and platoon sized units.

**177 52 INFANTRY PLATOON BATTLE COURSE (AC)****FAC: 1775****BFR Required: Y**

17752-1 **DEFINITION.** An Infantry Platoon Battle Course is designed for the training and qualification requirements of infantry platoons, either mounted or dismounted, on movement techniques and operations. This complex is used to train and test platoons on the skills necessary to conduct tactical movement techniques, detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. Targets are not fully automated and/or the scenarios are not computer driven or scored. EA is defined as a range area to support training of squad and platoon sized units.

**177 53 AUTOMATED INFANTRY PLATOON BATTLE COURSE (AC)****FAC: 1775****BFR Required: Y**

17753-1 **DEFINITION.** An Automated Infantry Platoon Battle Course is designed for the training and qualification requirements of infantry platoons, either mounted or dismounted, on movement techniques and operations. This complex is used to train and test platoons on the skills necessary to conduct tactical movement techniques, detect, identify, engage, and defeat stationary and moving armor and infantry targets in a tactical array. All targets are fully automated and

the event specific target scenario is computer driven and scored from the range operations center. EA is defined as a range area to support training of squad and platoon sized units.

**177 60 MOUT ASSAULT COURSE (MAC) (AC)**

**FAC: 1776**

**BFR Required: Y**

17760-1 **DEFINITION.** A MOUT Assault Course is a facility for low-level collective training using live fire or MILES. This facility is used for training specific tasks before training on unit proficiency MOUT sites or Combat in Cities facility, carried under Category Code 179 61. Targets are not fully automated and/or the scenarios are not computer driven or scored. EA is defined as a range area to support training of platoon-sized units.

**178 10 LIVE HAND GRENADE RANGE (AC)**

**FAC: 1781**

**BFR Required: Y**

17810-1 **DEFINITION.** A Live Hand Grenade Range is designed to satisfy the training requirement of throwing live fragmentation grenades. This range familiarizes soldiers with the effects of live fragmentation grenades. No automation is required for this facility. Count each throwing location as one FP.

**178 20 ENGINEER QUALIFICATION RANGE, NON-STANDARDIZED (AC)**

**FAC: 1782**

**BFR Required: Y**

17820-1 **DEFINITION.** An Engineer Qualification Range, Non-standardized, is designed to meet the training and qualification requirements for engineer and combat engineer crews. This range is used to train and test engineer crews on the skills necessary to zero and/or boresight weapons systems, identify, classify, and reduce obstacles. Targets are not fully automated and/or the scenarios are not computer driven or scored. Count each firing position on the stationary firing line as one FP. If a stationary firing line does not exist, then count each obstacle clearing station as one FP.

**178 21 ENGINEER QUALIFICATION RANGE, AUTOMATED / STANDARDIZED (AC)****FAC: 1782****BFR Required: Y**

17821-1 **DEFINITION.** An Engineer Qualification Range, Automated/Standardized, is designed for the training and qualification requirements of engineer and combat engineer crews. This range is used to train and test engineer Crews on the skills necessary to zero and / or boresight weapons systems, identify, classify, and reduce obstacles. All targets are fully automated and the event specific target scenario is computer driven and scored from the range operations center. Count each firing position on the stationary firing line as one FP. If a stationary firing line does not exist, then count each obstacle clearing station as one FP.

**178 30 LIGHT DEMOLITION RANGE (AC)****FAC: 1783****BFR Required: Y**

17830-1 **DEFINITION.** A Light Demolition Range is designed for the training and qualification of employing explosives and demolition charges. This range is used to train personnel on the proper techniques of wire, minefield and concrete obstacle breaching, timber and steel cutting, road cratering, and explosive demolition. No automation is required for this facility. Count each prepared station as one FP. Planning and scoping this function should consider user requirements and explosive safety criteria.

**179 TRAINING FACILITIES OTHER THAN BUILDINGS**

179-1 This basic category includes requirements for weapons ranges, training courses and mockups, training pools/tanks, and parade and drill fields, but it does not include expendable targets.

**179 01 BAYONET ASSAULT COURSE (AC)****FAC: 1790****BFR Required: Y**

17901-1 **DEFINITION.** A Bayonet Assault Course is designed for training assault techniques with a rifle and bayonet. These techniques are applied through a series of obstacles. This facility requires no automation. Report the number of FP as the number of prepared paths or set of targets in a standard path to be used in training.

**179 02 TARGET DETECTION (TD) RANGE, NON-FIRING****FAC: 1790****BFR Required: Y**

17902-1 **DEFINITION.** A Target Detection Range, Non-Firing, is a non-firing range to teach soldiers how to detect personnel on the battlefield under varying degrees of concealment and visibility. No automation is required for this range.

**179 03 HAND TO HAND COMBAT PIT****FAC: 1790****BFR Required: Y**

17903-1 **DEFINITION.** A Hand-to-Hand Combat Pit is a structure containing a circle of sand or sawdust for training in hand-to-hand fighting.

**179 04 PRISONER OF WAR TRAINING AREA****FAC: 1790****BFR Required: Y**

17904-1 **DEFINITION.** A Prisoner of War Training Area is typically an area fenced in with barbed wire and with guard towers used for the training of personnel in the handling of prisoners-of-war. The facility may also be used for the training of personnel in a simulated POW environment.

**179 05 MINE WARFARE AREA (AC)****FAC: 1790****BFR Required: Y**

17905-1 **DEFINITION.** A Mine Warfare Area is a cleared area for training in the placement, arming, disarming, and detection of vehicle and anti-personnel mines using non-explosive training material.

**179 06 WHEELED VEHICLE DRIVERS COURSE (AC)****FAC: 1790****BFR Required: Y**

17906-1 **DEFINITION.** A Wheeled Vehicle Drivers Course is for teaching basic driving skills, and for practice in four-wheel drive situations, parking, and backing up.

**179 07 TRACKED VEHICLE DRIVERS COURSE (AC)****FAC: 1790****BFR Required: Y**

17907-1 **DEFINITION.** A Tracked Vehicle Drivers Course is an area to teach the basic driving skills of steering and gear shifting on a level course. The facility may also contain a hilly course for developing advanced tracked vehicle driving skills such as turning on slopes and negotiating steep grades.

**179 08 AMPHIBIOUS VEHICLE TRAINING AREA (AC)****FAC: 1790****BFR Required: Y**

17908-1 **DEFINITION.** An Amphibious Vehicle Training Area contains sand or is close to a beach for training military personnel on unique driving, technical and tactical tasks associated with amphibious operations.

**179 09 SHIP LOADING AND UNLOADING MOCKUP (SF)****FAC: 1732****BFR Required: Y**

17909-1 **DEFINITION.** A mockup of a ship used for training personnel in ship loading and off-loading. Training area can also include negotiating cargo nets used during amphibious operations and operations at dockside.

**179 10 AIRCRAFT GUNNERY, BOMBING, AND ROCKET RANGES (EA)****FAC: 1793****BFR Required: N**

17910-1 **DEFINITION.** Aircraft Gunnery, Bombing and Rocket Ranges (Aircraft Weapons Ranges) provide air crews with operating areas for the development of proficiency in gunnery, bombing, rocketry, missile delivery, strafing, and mine laying. Ranges should generally be within 100 miles of the supporting air installation. The following criteria are not absolute as far as requirements are concerned; however, any plans to deviate from these criteria shall be referred to the Naval Air Systems Command.

17910-1.1 **Air-to-Air Weapons Ranges.** The Air-to-Air Weapons Ranges are Gunnery and Missile Ranges and should, if possible, be over water. The minimum surface impact areas and coincident restricted airspaces, whose minimum altitude is based on the characteristics of the using aircraft, are as follows:

- Gunnery Range - 23 nautical miles by 50 nautical miles.

- Rocket and Missile Ranges - 50 nautical miles square.

17910-1.2 **Air-to-Ground Ranges.** The Air-to-Ground Ranges are for training in strafing, high-altitude level bombing, loft bombing, close air support, aerial mining, and missile delivery. Communications are required between ground stations and between target controller and aircraft at these ranges. See Table 179-10 for specific surface impact areas, minimum restricted airspace, and other data applicable to air-to-ground ranges.

The following information for Air-to-Ground Weapons Ranges is provided in addition to that contained in Table 17910-1.

- **Strafing Range.** A strafing range is for air-to-ground gunnery proficiency training in low-altitude strafing firing 20-millimeter and possibly 30-millimeter ammunition. Targets may be panels or may simulate aircraft, gun emplacements, truck convoys, etc., and may be automatic recording targets.
- **High-Altitude Level-Bombing Range.** The high altitude level bombing range provides training in high-speed, high-altitude, level-altitude bomb releases. The center of the target is visible from 10 nautical miles at 50,000 feet. Offset bombing exercises are also conducted.
- **Multipurpose Target Range.** The multipurpose range is used for training in conventional dive bombing, high-altitude dive bombing, glide bombing, strafing, and rocketry (excluding controlled air-to-ground missiles). Inert training weapons with small charges are used to facilitate spotting.
- **Loft Bombing Range.** The loft bombing range is a highly instrumented land range for practice bombing with simulated nuclear weapons. A minimum altitude approach is used; bomb release maneuvers practiced include loft, toss, and over-the-shoulder techniques providing training in rapid recovery and escape from atomic-weapon effects, detection, and retaliatory ground fire.

The restricted airspace includes a 5-nautical-mile radius from the target center extending upward from the surface to 24,000 feet above the target and multiple-approach corridors extending 25 miles from target center. A 6-nautical-mile corridor width is required when alternate left or right escape maneuvers are performed. Clearance above the corridors is 3,000 feet for the first 10 nautical miles of the approach, 5,000 feet for the next 8 nautical miles, and 9,000 feet for the remaining 2 nautical miles to the airspace cylinder around the target center. The initial point of aim is at 50,000 feet from the target center which must be visible from an aircraft at

100 feet altitude. Instrumentation along the primary approach to the target provides instantaneous speed measurements, photo coverage, and profile and escape information.

- Close Air Support and Combat Training Area. The close air support and combat training area is planned for training with live ordnance, shapes, napalm, and air-to-ground missiles.
- Aerial Mining Range. The aerial mining range is planned for training in low-altitude and high-altitude mining. The restricted airspace is generally parallel to an adjacent irregular coastline with readily identifiable landmarks.
- Guided Missile Range. The air-to-ground guided missile target range is used for training in controlled air-to-ground missiles.

17910-2 The restricted airspace is 24,000 feet in height and consists of a rectangular- shaped primary line of approach 4 nautical miles wide by 5 nautical miles long starting at a point 15 nautical miles from the center of the impact area. The total length of the range is 20 nautical miles.



**Table 17910-1**  
**Basic Requirement for Air-to-Ground Ranges**

<b>Range</b>	<b>Minimum surface impact area (nautical miles)</b>	<b>Minimum restricted airspace (nautical miles)</b>	<b>Maximum restricted airspace (feet)</b>	<b>Control and spotting towers Note (2)</b>	<b>Target illumination for night operations</b>
A. Strafing	1 x ½	Radius 5	10,000	1 Control	Yes
B. High altitude level bombing	Radius 3	Radius 5	Unlimited	1 Control Note (3)	Yes
C. Multipurpose target	Radius 1-1/2	Radius 5	Note (1)	Note (4)	Yes
D. Loft bombing	Radius 1-1/2	Radius 5 Length 30 Note (8)	24,000 Note (8)	Note (5)	Yes
E. Close air support and combat training area	16 x 20	Radius 25	Note (1)	Note (6)	Yes
F. Aerial mining	3 x 8	3 x 8	Note (1)	Note (4)	No
G. Guided missile	8 x 8	Radius 5 Length 20 Note (8)	24,000	Note (6) and (7)	Yes

## Notes:

- (1) The restricted airspace extends vertically to the maximum altitude required by the using aircraft.
- (2) See Operational Tower, Category Code 179 35.
- (3) Two spotting towers also are required to provide accurate three-dimensional rake information where remote spotting devices are not used.
- (4) One control and two spotting towers are required to provide accurate three-dimensional rake information.
- (5) One control and three spotting towers are required.
- (6) One control tower and two spotting towers at each designated target site are required.
- (7) Towers are required only at ranges where self-guiding missiles are fired.
- (8) See detailed airspace description in text.

**179 11 AIR TRANSPORT MOCKUP (SY)****FAC: 8526****BFR Required: Y**

17911-1 **DEFINITION.** An Air Transport Mockup is a ramp and a platform structure used to simulate varying types of fixed- and rotary-wing aircraft. Structure allows loading, securing, and unloading of vehicles, equipment, and/or personnel.

**179 12 ELEVATED TRAINING TOWER/PLATFORM****FAC: 1734****BFR Required: Y**

17912-1 **DEFINITION.** A Elevated Training Tower/Platform is a structure consisting of platforms built above a sandy landing area to train future paratroopers proper aircraft exiting and landing techniques. It can consist of a canopy area and platform, a mockup of an aircraft door to train future paratroopers the proper exiting techniques from an aircraft as well as for parachute landing falls that simulates the deceleration experienced during a parachute opening.

**179 13 SUSPENDED HARNESS MOCKUP**

CCN deleted in FY19. Assets have been consolidated into CCN 179 12.

**179 14 MOCKUP JUMP TOWER**

CCN deleted in FY19. Assets have been consolidated into CCN 179 12.

**179 15 UNDERWATER FORDING SITE**

CCN deleted in FY19.

**179 16 COMBAT TRAIL (AC)****FAC: 1790****BFR Required: Y**

17916-1 **DEFINITION.** A Combat Trail is a training site used for various types of proficiency and sustainment training by rotation through different stations in a round-robin scenario. Types of training can include nuclear, Biological, and Chemical (NBC) and common task training. This site is separate from other training areas and sites.

**179 17 RAPPPELLING TRAINING AREA (EA)****FAC: 1790****BFR Required: Y**

17917-1 **DEFINITION.** A Rappelling Training Area is an area that includes at least one structure used to practice rappelling (rope descent). The training area may also include modified towers for training in helicopter rappels.

**179 18 AIRFIELD DEMOLITION RANGE (ADR) (SY)****FAC: 1164****BFR Required: Y**

17918-1 **DEFINITION.** An area for training in the placement, clearing, compaction, repair, and grading of fill and construction of drainage structures for airfields. Steel mats or other non-bituminous mats may be utilized. If the airfield is actually used by aircraft, it should be inventoried as an unpaved airfield facility using appropriate 100 series Category Codes.

**179 19 TIMBER BRIDGE AREA****FAC: 1790****BFR Required: Y**

17919-1 **DEFINITION.** A Timber Bridge Area is a cleared area beside a ditch or ravine for engineer units to practice building timber bridges.

**179 20 PANEL BRIDGE AREA****FAC: 1790****BFR Required: Y**

17920-1 **DEFINITION.** A Panel Bridge Area is a cleared area beside a creek or ravine for engineer units to practice building panel bridges.

**179 22 FLOATING BRIDGE SITE****FAC: 1790****BFR Required: Y**

17922-1 **DEFINITION.** A Floating Bridge Site is a cleared riverbank area for engineer units to practice fording water obstacles and erection and retrieval of floating bridging equipment.

**179 24 WATER SUPPLY TRAINING AREA (EA)****FAC: 1790****BFR Required: Y**

17924-1 **DEFINITION.** A Water Supply Training Area is partially improved land for performing water purification and storage operations. It should be located on a flowing stream with firm banks and all-weather access roads.

**179 25 AIRFIELD SITE SELECTION TRAINING AREA (AC)****FAC: 1790****BFR Required: Y**

17925-1 **DEFINITION.** An Airfield Site Selection Training Area is cleared land used to train soldiers in the fundamentals of selecting and securing a site suitable for takeoffs and parking of rotary-wing aircraft.

**179 26 AERIAL GUNNERY RANGE (AC)****FAC: 1792****BFR Required: Y**

17926-1 **DEFINITION.** An Aerial Gunnery Range is designed to support the training and qualification requirements of helicopter gunnery. This range is used to train and test helicopter crews on the skills necessary to detect, identify, engage, and hit stationary armor and infantry targets in a tactical array. This range does not require automation but does require surveillance of the target area.

**179 30 SURFACE PROJECTILE RANGE (EA)****FAC: 1767****BFR Required: N**

17930-1 **DEFINITION.** This code is for ranges supporting surface-launched projectiles as opposed to ranges for air-launched projectiles which are coded as Category Code 179 10. Criteria are not presently available for surface projectile range requirements.

**179 31 MEDIUM HEAVY EQUIPMENT TRAINING AREA (AC)****FAC: 1790****BFR Required: Y**

17931-1 **DEFINITION.** A Medium Heavy Equipment Training Area is an unimproved area for training in placement, compaction, and grading of fill, and training in construction of drainage structures.

**179 32 DECONTAMINATION TRAINING SITE (AC)****FAC: 1790****BFR Required: Y**

17932-1 **DEFINITION.** A Decontamination Training Site is an area consisting of a pit filled with rock with an attached rock-filled sump to a drain bed. This structure is used primarily for vehicle decontamination training.

**179 33 POL TRAINING AREA (AC)****FAC: 1790****BFR Required: Y**

17933-1 **DEFINITION.** A POL Training Area is a materials handling area for training personnel in the proper handling of petroleum, oils, and lubricants. Also used for assembly and training in various POL storage and distribution systems.

**179 35 WEAPONS RANGE OPERATIONS TOWER (EA)****FAC: 1734****BFR Required: N**

17935-1 **DEFINITION.** Range operations towers are used at gunnery, bombing, and rocket ranges to provide an unobstructed view of target areas for purposes of control and spotting impacts. For the tower requirements associated with the various ranges, see Category Code 179 10 (Table 179-10). The two types of weapons range operations tower are:

17935-1.1 The control range operations tower (control tower) has a gross area of 1,428 square feet and provides for the radio control of all range activities, including the scoring of training missions both visually and electronically.

17935-1.2 The spotting range operations tower (spotting tower) has a gross area of 100 square feet and is a secondary observation point to provide for visual scoring.

**179 36 CLOSE AIR SUPPORT RANGE (AC)****FAC: 1793****BFR Required: N**

17936-1 **DEFINITION.** A Close Air Support Range is designed to support the training and qualification requirements of close air support aircraft. This range is used to train and test aircraft crews on the skills necessary to provide air support to ground forces under varying conditions. This range does not require automation but does require surveillance of the target area.

**179 37 AERIAL BOMBING RANGE (AC)****FAC: 1793****BFR Required: N**

17937-1 **DEFINITION.** An Aerial Bombing Range is designed to support the training and qualification requirements for fixed-wing aircraft dropping their ordnance. This range is used to train and test aircraft crews on the skills necessary to detect and suppress enemy targets in a tactical array. This range does not require automation but does require surveillance of the target area.

**179 40 SMALL ARMS RANGE - OUTDOOR (EA)****FAC: 1750****BFR Required: Y**

17940-1 **DEFINITION.** A small arms range provides an area for training in the use of pistols, small caliber rifles, and small caliber machine guns. Ranges must be available all year to provide continual training and retraining for personnel who must be proficient in the use of small arms. If feasible, a small-arms range should provide training facilities for all military services within the area.

17940-2 The capacity of existing ranges or new requirements can be determined by:

17940-2.1 Identifying the number of personnel to be trained.

17940-2.2 Establishing the number and size of training sessions.

17940-2.3 Determining the number of hours per session and scheduling training over an annual basis.

17940-2.4 Calculating the required number of firing points based upon efficient arrangement of the size and schedules of the training groups.

17940-3 In developing requirements, the base number of training days less holidays and weekends is 242 days. However, ranges require maintenance and periods of recovery for flora and fauna and are often unusable during

periods of severe weather or peculiar local limitations. The basic number of training days can be further reduced to 180 days based on local conditions.

17940-4 For certain types of small arms and where prevailing weather conditions seriously interfere with scheduling of training, an indoor range (Code 171 50) may be planned.

**179 41 AIR DEFENSE MISSILE FIRING RANGE (AC)**

**FAC: 1794**

**BFR Required: Y**

17941-1 **DEFINITION.** An Air Defense Missile Firing Range is designed to meet training and qualification requirements of air defense (LAAD/Stinger) units. This range is used to train and test crews on the skills necessary to employ ground to air anti-aircraft missiles against ballistic aerial target systems (BATS).

**179 45 TRAINING MOCK-UPS (EA)**

**FAC: 1790**

**BFR Required: Y**

17945-1 **DEFINITION.** This code includes mockup structures representing all or parts of ships, aircraft, tanks, or buildings for training personnel in skills such as disaster control, firefighting, and equipment handling.

**179 50 TRAINING COURSE (AC)**

**FAC: 1790**

**BFR Required: N**

17950-1 **DEFINITION.** This code includes areas designated for personnel training in various skills under actual operational conditions. Table 17950-1 outlines the facilities of this group and approximate requirements.

**Table 17950-1  
Training Course Criteria**

Type of Course	Approximate Size	Preferred Terrain	Typical Improvements
Obstacle	2 acres	Flat	Obstacles, drainage
Combat techniques, guerrilla warfare, counterinsurgency	100 acres	Rough, heavy vegetation	Provisional mess hall and toilets where justified
Weapons ranges	See Code 179-10		

Type of Course	Approximate Size	Preferred Terrain	Typical Improvements
Disaster control, firefighting, etc.	2 acres	Flat	Training mockups
Field engineering surveying practice	2 acres	Rolling	None
Building construction practice	2 acres	Flat	1,200 square yards of paved area
Construction equipment operations	20 acres	Rolling, no vegetation	None
Vehicle safety, driver testing	6 acres	Flat	Pave area, course markers
Swimming, survival	See Code 179-55		

**179 51 UNENCLOSED FIRE FIGHTER TRAINER (SF)****FAC: 1795****BFR Required: Y**

17951-1 **DEFINITION.** A Fire Fighting and Rescue Training Area is an open area or structure consisting of a mockup of a multistory building, aircraft, or vehicle for training in fire containment, ladder use, escape, and rescue from buildings.

**179 53 ENCLOSED FIRE FIGHTER TRAINER FACILITY (SF)****FAC: 1726****BFR Required: Y**

17953-1 **DEFINITION.** This is an enclosed facility that houses interior and exterior mockups of areas within a surface ship, submarine, or multistory building for live firefighting and rescue training.

**179 54 DAMAGE CONTROL (WET) TRAINER (SF)****FAC: 1724****BFR Required: Y**

17954-1 **DEFINITION.** This category code is used to capture facilities used in the training of shipboard flooding countermeasures. Facilities include below-deck shipboard mockups with water deluge systems, observation decks, training classrooms, administrative spaces, and water deluge pumps, piping, and drainage systems.



**179 55 COMBAT TRAINING POOL/TANK (EA)****FAC: 1725****BFR Required: Y**

17955-1 **DEFINITION.** A combat training pool/tank is planned for instructions in swimming and survival under combat conditions. The swimming pool/tank may be provided only as required for training purposes, normally on the following basis: for each increment of 5,000 men to be trained, one swimming pool; pool area not to exceed 13,000 square feet. If survival training is required at installations having less than 5,000 assigned strength, one swimming pool of appropriate size may be provided, but not to exceed 13,000 square feet in pool area. Outdoor pools may be provided where feasible.

**179 60 PARADE AND DRILL FIELD (AC)****FAC: 1745****BFR Required: N**

17960-1 **DEFINITION.** This facility provides space for formation drills, parade and review functions, and honor ceremonies. Such a field may be planned for stations having independent command functions. The size of the field is computed on the basis of 1 acre per 125 men, total planned military strength. Surface will be turf where feasible and will be stabilized where climate and other conditions dictate. A reviewing stand may be planned with a capacity based on 5 percent of the total officer strength.

**179 61 COMBAT IN CITIES FACILITY (AC)****FAC: 1790****BFR Required: Y**

17961-1 **DEFINITION.** A Combat in Cities Facility is a non-standard training facility that typically includes the buildings, roads, and sidewalks normally found in an urban environment, and which is used to train and sustain unit proficiency in an urban environment. This facility is used to train urban-type operations when a standard CACTF is not available. No automation is required for this facility.

**179 62 MOUT COLLECTIVE TRAINING FACILITY (SMALL) (AC)****FAC: 1790****BFR Required: Y**

17962-1 **DEFINITION.** A MOUT Collective Training Facility (small) is designed to meet the training requirements of an infantry company-sized unit in an urban environment. This structure contains 24 buildings or less and is used to train unit collective tasks associated with urban terrain. Targets are not fully automated and/or the scenarios are not computer driven or scored.

**179 63 MOUT COLLECTIVE TRAINING FACILITY (LARGE) (AC)****FAC: 1796****BFR Required: Y**

17963-1 **DEFINITION.** A MOUT Collective Training Facility (large) is designed to meet the training requirements of an infantry battalion-sized unit in an urban environment. This structure contains more than 24 buildings and is used to train unit collective tasks associated with urban terrain. Targets are not fully automated and/or the scenarios are not computer driven or scored.

**179 70 RADAR BOMB SCORING FACILITY (EA)****FAC: 1790****BFR Required: N**

17970-1 **DEFINITION.** A Radar Bomb Scoring Facility (RBS) is used to measure, electronically, aircraft simulated-bombing results and to produce graphic flight path tracking data and other pertinent aircraft target scoring information. An RBS facility is available as a self-contained trailer-mounted facility. The mobile RBS equipment includes an operations trailer, acquisition radar, tracking radar, maintenance and spare parts trailer, and power trailer. A permanent power supply at the range eliminates the power trailer requirement. Criteria are not presently available for a fixed RBS System which would utilize permanent structures. RBS facilities are provided for selected aircraft ranges as determined by CNIC.

**179 71 ELECTRONIC WARFARE TRAINING RANGE (EA)****FAC: 1790****BFR Required: N**

17971-1 Criteria for the Electronic Warfare Training Range are not currently available.

**179 72 UNDERWATER TRACKING TRAINING RANGE (EA)****FAC: 1790****BFR Required: Y**

17972-1 **DEFINITION.** The underwater tracking range is used primarily to support surface and subsurface weapon system accuracy trials and development, test, and evaluation projects. No planning factors are currently available for this facility. Planning factors, standards, and guides for computing requirements for facilities under this category are excluded from this publication because of the special provisions and variances in the application of criteria for planning underwater tracking ranges. In the absence of specific criteria, the quantitative requirements for the range facilities should be determined on an individual basis based on the experience and knowledge of the activity involved and the appropriate Systems Commands.

**179 81 INFILTRATION COURSE (AC)**

**FAC: 1798**

**BFR Required: Y**

17981-1 **DEFINITION.** An Infiltration Course is designed for training individual infiltration and combat movement techniques and then executing them while subject to live fire. No automation is required for this facility. Count each path or trail for a single Marine as one FP.

**179 91 CONFIDENCE COURSE (AC)**

**FAC: 1799**

**BFR Required: Y**

17991-1 **DEFINITION.** A Confidence Course is designed for developing individual soldier confidence and strength through a series of obstacles. No automation is required for this facility. Count each complete course as one EA.

**179 92 OBSTACLE COURSE (AC)**

**FAC: 1799**

**BFR Required: Y**

17992-1 **DEFINITION.** An Obstacle Course is a facility containing numerous obstacles designed for developing and measuring individual soldier speed, agility, and coordination utilizing various obstacles in an effort to reach the objective. No automation is required for this facility.

**FACILITIES CRITERIA (FC)**  
**FACILITY PLANNING FOR NAVY AND**  
**MARINE CORPS SHORE INSTALLATIONS**

**Series 200: Maintenance and Production Facilities**

**Record of Changes:**

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of change</b>
Nov 2016	21154	Aircraft Armament Systems Shop	Title of this CCN is changed from "Aviation Armament Shop" to "Aircraft Armament Systems Shop". Criteria was also revised.
Dec 2016	21374	Landing Craft Rinse Rack	CCN deleted
Dec 2016	22940	Sawmill	CCN deleted
Dec 2016	22960	Baling Facility	CCN deleted
Dec 2016	21107	Maintenance Hangar - 02 Space (Administrative)	FAC code changed from 1444 to 6100
Jan 2017	21940	Sewage Hose Storage Facility	Reporting requirements corrected to "N". CCN is inventory only.
Jan 2017	21820	Construction / Weight Handling Equipment Shop	Incorrect diagram reference deleted.
Feb 2017	21920	Pavement And Ground Equipment Shed	Change reporting requirements to "N" as per verbiage in CCN 21910
Feb 2017	21925	Public Works Shops Expendable/Work-In-Process Store	Change reporting requirements to "N" as per verbiage in CCN 21910
May 2018	21181	Engine Test Cell (Non-NAVAIR Depot)	Updated criteria
May 2018	21105	Maintenance Hangar – O/H Space (High Bay)	Updated criteria
May 2018	21106	MAINTENANCE HANGAR – 01 SPACE (Shops And Maintenance Space)	Updated criteria

Date	CCN #	CCN Title	Description of change
May 2018	21107	Maintenance Hangar – 02 Space (Administrative)	Updated criteria
Aug 2019	21101	Aircraft Engine Test Cell Building	Title of this CCN is changed from "Aircraft Acoustical Enclosure" to "Aircraft Engine Test Cell Building".
Sep 2019	21107	Maintenance Hangar – 02 Space (Administrative)	Replaced reference to “UFC 4-211-01N” with “UFC 4-211-01, as updated”
Sept 2019	21105	Maintenance Hangar – O/H Space (High Bay)	Corrected formula for OH required hangar width. Added references to Type IV hangar as a new standard type. Added details to clarify notes for Tables 21105-1a and 21105-1b regarding clearances in the OH space. Added a reference to UFC 4-211-01 for further details. Added clarification for computation of hangar width in Section 21105/06/07-2.1. Also added in this section was a clarification that if an additional designated space is required for PMI, one more space with spread configuration will be provided per Type/Model/Series per installation.
Mar 2020	21105	Maintenance Hangar – O/H Space (High Bay), Table 21105-2	Interim update - Update hangar ratio for P-8A squadrons with a new ratio of ¼ to reflect actual maintenance frequencies.
	21105	Maintenance Hangar – O/H Space (High Bay), Table 21105-1a	Expanded the width for Type I standard module for the US Marine Corps from 262.5 ft to 270.0 ft to provide the capabilities to conduct periodic maintenance interval work for both F-35B and F-35C Variants. Marine Corps squadrons operate both variants.
July 2020	21211	Missile Module Maintenance and Loading Facility	Added new CCN
July 2020	21331	Shore Depot Level Repair Shop	Added new CCN
July 2020	21332	Shipyards Demilitarization and Recycling Facility	Added new CCN
July 2020	21365	Ship Propulsion Maintenance Facility	Title change from “Nuclear Repair Shop” to remove the word “nuclear”, as per OSD. Also, revised description.

Date	CCN #	CCN Title	Description of change
Feb 2021	21105	Maintenance Hangar – OH Space	Updated hangar ratios in Table 21105-2 for training squadrons under CNATRA to reflect accurate maintenance frequencies. The updated ratios are 0.28 for T-44A and T-44C Variants, and 0.39 for T-6A and T-6B Variants.
June 2021	21105	Maintenance Hangar – OH Space	Add Table 21105-1b, OH Space Standard, F-35C Model. Add Table 21105-1c, OH Space Standard, F-35B Model. Add Figure 1 – OH Space Diagram of F-35C Add Figure 2 – OH Space Diagram of F-35B.
June 2021	21105 21106  21107	Maintenance Hangar – OH Space Shops and Maintenance Administration – 01 Space  Operations, Training, and Administration – 02 Space	Information added for Type IV Maintenance Hangar Add Section 21105/06/07-2.4, Type IV Unmanned Aircraft System Requirements. Add Table 21105-2a, OH Space Navy Standard, MQ-4C Triton Model. Add Figure 3 – OH Space Diagram of MQ-4C Triton. Add 21105-7, 01 Space Calculations for MQ-4C Triton. Add 21105-8, 02 Space Calculations for MQ-4C Triton.
October 2021	211 64	Ground Support Equipment Holding Shed (NavAir Depot)	Changed FAC Code to 2185
October 2021	214 40	Vehicle Holding Shed	Changed FAC Code to 2185
October 2021	218 61	Ground Support Equipment Holding Shed	Changed FAC Code to 2185
October 2021	218 65	Equipment Holding Shed (for Code 218-20)	Changed FAC Code to 2185
31 July 2022	218 52	Battery Recharging Shed	Add new category code.
22 Sep 2022	21105 21106  21107	Maintenance Hangar – OH Space Shops and Maintenance Administration – 01 Space  Operations, Training, and Administration – 02 Space	On page 200 Series - 31, delete the words “crew and equipment” and replace with the words “shop and maintenance.”  On page 200 Series - 31, delete the word “administrative” and add the words “operations; training; and administration.”
30 Sep 2022	21105 21106  21107	Maintenance Hangar – OH Space Shops and Maintenance Administration – 01 Space  Operations, Training, and	Change width of wings spread for the C-40A aircraft to 35.8 (meters) and 117-5 (ft.-in.) in Table 21105-3 (Aircraft Widths and Hangar Space Requirements).

**FC 2-000-05N**

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of change</b>
		Administration – 02 Space	
2 Mar 2023	200 Series	UFC 2-000-05N	Change UFC 2-000-05N to FC 2-000-05N document due to the fact that this planning criteria is not unified among the other DoD services.
9 Jun 2023	200 Series	FC 2-000-05N	Include the correct SI unit of area as m <sup>2</sup> throughout the criteria where applicable.
	211-05/06/07	Section 21105/06/07-2.1 Category Code 211-05 – OH Space, page 42	Under heading “FOR P-8A AIRCRAFT,” add reference to table 21105-3 with that of table 21105-2.
28 Jun 2023	211-05	Maintenance Hangar – OH Space	Under the heading “Calculating OH Space,” update the following: Update nomenclature for aircraft spacing requirements. Revise Table 21105-4 (Required Hangar Width Formulas).  Note: Updates are required to be commensurate with the Type I Maintenance Hangar Study.
26 Jul 2023	211-05	Maintenance Hangar – OH Space	For Type III Maintenance Hangar data in Table 21105-1d, change m <sup>2</sup> heading to sq.ft. heading to reflect the correct unit of measure units.
21 Aug 2023	211-05	Maintenance Hangar – OH Space	Add notes at the end of Table 21105-4, Required Hangar Width Formulas, which explains procedures for rounding numbers when calculating the number of aircraft in a hangar.  Change “Sample Maintenance Hangar Calculation to align with the Type I Maintenance Hangar formula in Table 21105-4.

## 200 SERIES MAINTENANCE AND PRODUCTION FACILITIES

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## **211 MAINTENANCE - AIRCRAFT, SPARES**

### **211-1 GENERAL**

Facilities for the maintenance and repair of Navy and Marine Corps aircraft and related spares, including airframes, aircraft engines, aircraft weapons systems, avionics systems, and other related aircraft equipment are planned in accordance with maintenance functions and levels as authorized by the Chief of Naval Operations (CNO). Maintenance classifications are defined in OPNAVINST 4790.2 (series) and are the basis for the Naval Aircraft Maintenance Program (NAMP). These classifications of aircraft maintenance activities of the Naval Establishment are divided into three levels: depot (“D” level) maintenance, intermediate (“I” level) maintenance, and organizational (“O” level) maintenance.

Depot or “D” level maintenance is performed at Naval Aviation industrial establishments to ensure continued flying integrity of airframes and flight systems during subsequent operational service periods. It is performed on material requiring major overhaul or rebuilding of parts, assemblies, subassemblies, and end items. It includes manufacturing parts, making modifications, testing, inspecting, sampling, and reclamations. Depot maintenance supports lower levels of maintenance by providing engineering assistance and performing maintenance that is beyond the capability of the lower level activities. Each requirement for depot maintenance facilities must be planned and justified individually.

“I” level maintenance is the responsibility of, and performed by, designated maintenance activities in support of organizational level activities. The intermediate level maintenance mission is to enhance and sustain the combat readiness and mission capability of supported activities by providing quality and timely support at the nearest location with the lowest practical resource expenditure. Intermediate level maintenance consists of on and off equipment material support and is usually performed at a central facility located either directly on or just off the flight line. Some specific functions of intermediate or “I” level maintenance are shown in Table 21100-1.

Intermediate Maintenance Activities (IMAs) are usually established to support an entire air station or Marine Air Group (MAG). In specific circumstances, IMA shops may be established for support of a specific unit as a department of what would normally be considered an organizational level unit. An example of this would be the establishment of an avionics shop to repair just the special mission equipment installed in reconnaissance aircraft, where only a single squadron at an air station has these aircraft. That shop would be inside the squadron hangar, under the direct control of the squadron Aircraft Maintenance Officer.

**Table 21100-1  
Intermediate Level Maintenance Functions**

<b>Title</b>	<b>Work Center Code</b>	<b>Category Code Number</b>	<b>Function</b>
Aircraft Intermediate Maintenance Activity Management	000	211 16	Supervisory, production control, material and financial management, quality control, training, administration.
Engine Maintenance Shop	400	211 21	Repair of aircraft engines and components, including removal and replacement of compressor sections, combustion sections, turbine sections, engine accessories, propellers and rotor components, auxiliary power units, auxiliary fuel cells, and in-flight refueling stores.
Airframes Shop	500	211 08	Repair and manufacture of aircraft structural and hydraulic components including structural panels, tire and wheel assemblies, brakes, hydraulic pumps, actuators, and line, painting, machining and welding, and non-destructive inspection (NDI).
Avionics Shop	600	211 45	Repair of aircraft avionics and electrical systems including communication, navigation and identification systems, electrical and instrument systems, generators and batteries, fire control systems, radar and electronic counter measures systems, anti-submarine warfare systems, precision measuring equipment and calibration, reconnaissance and photo systems, and module repair and wire harness manufacture.
Armament Shop	700	211 54 211 55	Repair and storage of weapons racks, launchers, guns, tow reels, and, for the Marine Corps, weapons support equipment.
Parachute and Survival Equipment Shop	800	211 75	Repair, maintenance, and periodic inspection of parachutes, life rafts and flotation systems, aviators survival equipment, oxygen regulators and generating systems, ejection seats, and oxygen and nitrogen generating and storage.
Ground Support Equipment Shop	900	218 60 218 61	Repair, maintenance, and storage of aircraft ground support equipment including tow tractors, check stands, aircraft starting units, electrical power carts, hydraulic power carts and servicing units, oxygen and nitrogen servicing carts, and mobile maintenance facilities (vans).

Organizational, or "O" level maintenance, and intermediate, or "I" level maintenance is performed at the individual sites where aircraft are stationed. Both maintenance levels

are segregated into nine divisions, three organizational and six intermediate. These divisions are coded as 100, 200, and 300 for the organizational level maintenance and 400 through 900 for the intermediate level maintenance.

Organizational or “O” level maintenance is normally performed by an operating unit on a day-to-day basis in support of their own operations. The organizational level maintenance mission is to maintain assigned aircraft and aeronautical equipment in a full mission capable status while continually improving the local maintenance process. While organizational level maintenance may be done by intermediate or depot level organizations, it is usually accomplished by maintenance personnel assigned to aircraft squadrons either in aircraft maintenance hangars or on the parking apron immediately outside of the hangar. Some specific functions of the organizational or “O” level maintenance are shown in Table 21100-2.

**Table 21100-2  
Organizational Level Maintenance Functions**

Title	Work Center Code	Category Code Number	Function
Aircraft Division	100	211-06	On aircraft repair and removal and replacement of engines, structural and hydraulic components, aircrew personal and protective equipment, egress and environmental systems, and periodic maintenance.
Avionics/Armament Division	200	211-06	On aircraft repair and removal and replacement of avionics, electrical, instrument, and fire control systems.
Line Division	300	211-06	Plane captains, flight line troubleshooters, support equipment operators, and flight crew.

These are the basic definitions for each level of maintenance. However, when temporarily required by operational or combat necessity, any appropriate operational authorities may authorize or require the performance of any maintenance task that, in their judgment, is within the capability of the personnel, materials, and facilities available.

Any of the three levels of maintenance may be performed by a contracted maintenance organization. The requirements for facilities then are a function of the contract. Additional facilities will not be built to support contract maintenance.

When it is desirable to keep aircraft under local control, space may be required to perform aircraft in-service repair (ISR), integrated maintenance (IMC/IMP),

modifications (MOD) and other program work that may concurrently involve depot, intermediate, and organizational level work on aircraft by squadron, IMA, Naval Air Depot (NAVAIR Depot), and/or contractor personnel. When the existing organizational level spaces cannot accommodate the additional workload generated by ISR, IMC/P, and/or MOD a separate facility will be required.

Those facilities generally categorized as Organizational “O” Level Maintenance facilities are as follows:

211 03	Corrosion Control Hangar
211 04	Pre-Engineered Hangar
211 05	Maintenance Hangar – OH Space
211 06	Maintenance Hangar – 01 Space
211 07	Maintenance Hangar – 02 Space

Those facilities generally categorized as Intermediate “I” Level Maintenance facilities are as follows (also noted as Non-NAVAIR Depot):

211 01	Aircraft Acoustical Enclosure (Non-NAVAIR Depot)
211 08	Airframes Shop (Non-NAVAIR Depot)
211 09	Aircraft Boresight Range (Non-NAVAIR Depot)
211 16	Aircraft Intermediate Maintenance Management (Non-NAVAIR Depot)
211 21	Engine Maintenance Shop (Non-NAVAIR Depot)
211 45	Avionics Shop (Non-NAVAIR Depot)
211 54	Aviation Armament Shop (Non-NAVAIR Depot)
211 55	Aviation Armament Equipment Holding Shed (Non-NAVAIR Depot)
211 75	Parachute/Survival Equipment Shop (Non-NAVAIR Depot)
211 81	Engine Test Cell (Non-NAVAIR Depot)
211 82	Aircraft Weapons Alignment Shelter (Non-NAVAIR Depot)
211 88	Power Check Pad with Sound Suppression (Non-NAVAIR Depot)
211 89	Power Check Pad without Sound Suppression (Non-NAVAIR Depot)

Those facilities generally categorized as Depot “D” Level Maintenance facilities are as follows (also noted as NAVAIR Depot):

211 10	Aircraft Overhaul and Repair Shop (NAVAIR Depot)
211 11	Corrosion Control – Cleaning Shop (NAVAIR Depot)
211 12	Paint and Finishing Hangar (NAVAIR Depot)
211 13	Aircraft Non-Destructive Testing Shop (NAVAIR Depot)
211 14	Aircraft Rework Shop (NAVAIR Depot)
211 20	Aircraft Engine Overhaul Shop (NAVAIR Depot)
211 22	Engine Preparation and Storage Shop (NAVAIR Depot)

211 23	Engine Examination and Evaluation Shop (NAVAIR Depot)
211 24	Dedicated Aircraft Engine Overhaul – General Process (NAVAIR Depot)
211 25	Jet Engine Overhaul Shop (NAVAIR Depot)
211 26	Reciprocating Engine Overhaul Shop (NAVAIR Depot)
211 27	Turbine Engine Overhaul Shop (NAVAIR Depot)
211 30	Aircraft and Engine Accessories Overhaul Shop (NAVAIR Depot)
211 31	Dedicated Aircraft and Engine Accessories Overhaul – General Process (NAVAIR Depot)
211 32	Metal Components Shop (NAVAIR Depot)
211 33	Non-Metals Components Shop (NAVAIR Depot)
211 34	Dynamic Components Shop (NAVAIR Depot)
211 35	Hydraulic Components Shop (NAVAIR Depot)
211 36	Electrical Component Shop (NAVAIR Depot)
211 37	Turbine Accessories Shop (NAVAIR Depot)
211 38	Pneumatic Oxygen Shop (NAVAIR Depot)
211 39	Optical and Photographic Components Shop (NAVAIR Depot)
211 40	Electronics, Communication and Armament System Shop (NAVAIR Depot)
211 41	Dedicated Electronics, Communication and Armament – General Process (NAVAIR Depot)
211 42	Electronic System Components Shop (NAVAIR Depot)
211 43	Inertial Quality Instrument Overhaul Shop (NAVAIR Depot)
211 44	Non-Inertial Quality Instrument Overhaul Shop (NAVAIR Depot)
211 50	Aircraft Armament/Missile Rework Shop (NAVAIR Depot)
211 51	Dedicated Aircraft Armament/Missile Rework – General Process (NAVAIR Depot)
211 52	Aircraft Weapon Overhaul and Test Shop (NAVAIR Depot)
211 53	Air Launched Missile Rework Shop (NAVAIR Depot)
211 60	Support Equipment Rework Shop (NAVAIR Depot)
211 61	Dedicated Support Equipment Rework – General Purpose Shop (NAVAIR Depot)
211 62	Support Equipment Calibration Shop (NAVAIR Depot)
211 63	Ground Support Equipment Rework Shop (NAVAIR Depot)
211 64	Ground Support Equipment Holding Shed (NAVAIR Depot)
211 65	Airborne Weapons Support Equipment Shop (NAVAIR Depot)
211 70	Manufacturing and Repair Shop (NAVAIR Depot)
211 71	Dedicated Manufacturing and Repair – General Purpose Shop (NAVAIR Depot)
211 72	Metal Fabrication/Manufacturing Shop (NAVAIR Depot)
211 73	Metal Treatment Shop (NAVAIR Depot)
211 74	Non-Metal Fabrication/Manufacturing Shop (NAVAIR Depot)
211 76	Miscellaneous Parts/Components Repair Shop (NAVAIR Depot)
211 80	Test and Calibration Shop (NAVAIR Depot)
211 83	Engine Test Cell (NAVAIR Depot)

211 84	Helicopter Blade Test Facility (NAVAIR Depot)
211 85	Radome Test Facility (NAVAIR Depot)
211 86	Radar/Antenna Test Facility (NAVAIR Depot)
211 87	Aircraft Weapons Alignment/Boresight Facility (NAVAIR Depot)
211 90	Other Support Facilities (NAVAIR Depot)
211 91	Uncovered Ramp (NAVAIR Depot)
211 92	Covered Ground Check/Flight Test Facility (NAVAIR Depot)
211 93	Engineering Laboratory (NAVAIR Depot)
211 94	Aircraft Power Check Facilities (NAVAIR Depot)
211 95	Material and Equipment Staging/Storage Facility (NAVAIR Depot)
211 96	Maintenance, Aircraft Spares Storage (Ready Issue/Shop Storage Miscellaneous)
211 97	Plant Services for Aircraft Overhaul (NAVAIR Depot)
211 98	Aircraft Acoustical Enclosure (NAVAIR Depot)
211 99	Hazardous Materials Storehouse (NAVAIR Depot)

## 211-2        NAVAIR DEPOT FACILITIES

Consistent with DoD Instruction 4151.15, "Depot Maintenance Support Programming Policies," dated November 22, 1976, NAVAIR Depot facilities can be further segregated into Production Shop Categories consistent with the material the shops are established and designed to process and produce as follows:

211-2.1.        **Airframe.** These are covered areas associated with processing the airframe under those programs commonly identified as Standard Depot Level Maintenance (SDLM), Programmed Depot Maintenance (PDM), On-Condition Maintenance (OCM), crash damage repair and/or overhaul, modernization, modification, etc. The work functions include cleaning, stripping, disassembly, airframe repair, reassembly, systems check, refinishing, painting, and fueling/defueling using covered facilities. Typical facilities associated with the Airframe Production Shop and their associated Navy Category Codes are:

211 10	Aircraft Overhaul and Repair Shop (Small Aircraft)
211 10	Aircraft Overhaul and Repair Shop (Large Aircraft)
211 11	Corrosion Control Shop
211 12	Paint and Finishing Hangar
211 13	Airframes Nondestructive Inspection Shop
211 14	Airframe Dedicated Machine Shop
211 14	Airframe Dedicated Welding Shop
211 14	Airframe Dedicated Plating Shop
211 14	Airframe Examination and Evaluation, Pre-Shop Analysis and Examination and Inspection Shop
211 14	Maintenance Dock
211 14	Quick Engine Change Shop
211 14	Fuel Systems Maintenance Facility

211-2.2      **Engine.** These are covered areas associated with processing jet, turbojet, and reciprocating type aviation engines in terms of overhaul, low time repair, complete repair, and major inspection. The work functions include uncanning, disassembly, cleaning, material examination, parts reconditioning, subassembly, final assembly and preservation.

Typical facilities associated with the Engine Production Shop and their associated Navy Category Codes are:

211 22	Engine Preparation and Storage Shop
211 23	Engine Nondestructive Testing Shop
211 23	Engine Examination and Evaluation, Pre-Shop Analysis and Examination and Inspection Shop
211 24	Dedicated Engine Cleaning Shop
211 24	Dedicated Engine Paint Shop
211 24	Dedicated Engine Plating Shop
211 24	Dedicated Engine Welding Shop
211 24	Engine Modification and Repair Shop
211 25	Jet Engine Overhaul Shop
211 26	Reciprocating Engine Overhaul Shop
211 27	Turbine Engine Overhaul Shop

211-2.3      **Accessories and Components.** These are covered areas associated with processing airframe and engine accessories. Typical facilities associated with the Accessories and Components Production Shop and their associated Navy Category Codes are:

211 30	Aircraft and Engine Accessories Overhaul Shop
211 31	Dedicated Cleaning Shop
211 31	Dedicated Paint Shop
211 31	Dedicated Machine Shop
211 31	Dedicated Plating Shop
211 31	Dedicated Welding Shop
211 31	Examination and Evaluation, Pre-Shop Analysis, Examination and Inspection Shop
211 31	Hazardous Test Shop
211 31	Reclamation Shop
211 32	Tank and Radiator Repair Shop
211 32	Sheet Metal Shop
211 32	Metal Surface Shop
211 32	Seat Repair Shop
211 32	Metal Bonding Shop
211 32	Container Reclamation Shop
211 33	Life Raft Repair Shop
211 33	Rubber Repair Shop



211 33	Parachute Repair Shop
211 33	Fabric and Upholstery Shop
211 33	Tire Repair Shop
211 33	Plastic and Fiberglass Shop
211 33	Composite Rework Shop
211 34	Propeller and Propeller Control Overhaul Shop
211 34	Rotor Head Overhaul Shop
211 34	Rotor Blade Overhaul Shop
211 34	Transmission/Gearbox Overhaul Shop
211 34	Dynamic Drive System Overhaul Shop
211 35	Hydraulic Components Overhaul Shop
211 35	Bearings Shop
211 35	Aircraft Landing Gear Shop
211 36	Alternator Drive Overhaul Shop
211 36	Electrical Accessories Overhaul and Test Shop
211 36	Battery Shop
211 36	Constant Speed Drive Shop
211 36	Electro-Mechanical Components Shop
211 37	Turbine Accessories Overhaul Shop
211 37	Turbine Accessories Test Shop
211 37	General Purpose Units Shop
211 37	General Purpose Units Test Shop
211 37	Ram/Air Turbine Accessories Overhaul Shop
211 37	Ram/Air Turbine Accessories Test Shop
211 38	Pneumatic Components Overhaul Shop
211 38	Cryogenics Shop
211 38	Oxygen Equipment Shop
211 39	Photographic Equipment Repair Shop
211 39	Optical Component Shop

211-2.4      **Electronic, Communications and Armament Systems.** These are covered areas associated with processing airborne communication and navigation equipment, instruments, airborne data computers, fire control and bombing system equipment, gyroscopes, inertial guidance systems, and other avionics equipment. Typical facilities associated with the Electronic, Communications and Armament Systems Production Shop and their associated Navy Category Codes are:

211 41	Dedicated Cleaning Shop
211 41	Dedicated Paint Shop
211 41	Dedicated Machine Shop
211 41	Dedicated Welding Shop
211 41	Dedicated Plating Shop
211 41	Dedicated Bearings Shop
211 41	Instrument Overhaul Shop

211 42	Armament and Avionics Shop
211 42	Airborne Systems Software Shop
211 42	Navigational Aids Repair Shop
211 42	Avionics Testing Shop
211 43	Inertial Quality Gyroscope Overhaul Shop
211 43	Inertial Guidance System Overhaul and Calibration Shop
211 44	Electronic Instrument Overhaul Shop
211 44	Mechanical Instrument Overhaul Shop
211 44	Non-inertial Gyroscope Overhaul Shop
211 44	Magnetic Instrument Overhaul and Test Shop

211-2.5      **Armament.** These are covered areas associated with processing weapons including guns, missiles, bomb racks, weapon pylons, etc., used by the aircraft in carrying out its assigned mission. Typical facilities associated with the Armament Production Shop and their associated Navy Category Codes are:

211 51	Dedicated Cleaning Shop
211 51	Dedicated Paint Shop
211 51	Dedicated Machine Shop
211 51	Dedicated Welding Shop
211 51	Dedicated Plating Shop
211 52	Aircraft Weapon Overhaul and Test Shop
211 52	Ordnance Equipment Shop
211 52	Weapon Accessories Repair Shop
211 53	Missile Shop

211-2.6      **Support Equipment.** These are covered areas associated with processing aviation general and special support equipment and aerospace ground support equipment. Typical facilities associated with the Support Equipment Production Shop and their associated Navy Category Codes are:

211 61	Dedicated Cleaning Shop
211 61	Dedicated Paint Shop
211 61	Dedicated Machine Shop
211 61	Dedicated Plating Shop
211 61	Dedicated Welding Shop
211 62	Aeronautical Electronic Support Equipment Shop
211 62	Electronic Test Systems Repair Shop
211 62	Precision Measurement Equipment Shop
211 63	GSE Maintenance Shop
211 63	Training Devices Shop
211 63	Hydrostatics Shop
211 64	Ground Support Equipment Holding Shed
211 65	Airborne Weapons Support Equipment Shop

211-2.7 **Manufacture and Repair.** These are covered areas which are not an integral part of other categories previously described and which contribute to aircraft repair operations by such work functions as parts cleaning and painting, plating and metal processing shop. Typical facilities associated with the Manufacture and Repair Production Shop and their associated Navy Category Codes are:

211 71	Welding Shop
211 71	Foundry Shop
211 71	Peening and Blasting Shop
211 71	Non-destructive Inspection Shop
211 71	Parts Cleaning Shop
211 71	Parts Painting Shop
211 72	Machine Shop
211 72	Grinding Shop
211 72	NC Machine Shop
211 72	Metal Parts Fabrication Shop
211 73	Metal Processing Shop
211 73	Plating Shop
211 73	Heat Treating Shop
211 74	Plastic Fabrication Shop
211 74	Pattern Shop
211 74	Decal Shop
211 74	Woodworking Shop
211 74	Rubber Fabrication Shop
211 76	Tubing Shop
211 76	Cable Shop
211 76	Cordage Shop
211 76	Electrical Cable/Harness Shop

211-2.8 **Test and Calibration.** These are covered areas which are dedicated to test, trim, or calibrate engines, electronics, communications or armament systems. Typical facilities associated with the Test and Calibration Production Shop and their associated Navy Category Codes are:

211 83	Jet Engine Test Cell (10,000 – 16,000 lbs. max. thrust)
211 83	Jet Engine Test Cell (Over 16,000 lbs. max. thrust)
211 83	Jet Engine Test Stand
211 83	Turbo Prop Test Cell
211 83	Reciprocating Engine Test Cell (3,000 HP or less)
211 83	Reciprocating Engine Test Cell (Over 3,000 HP)
211 83	Reciprocating Engine Test Stand
211 83	Turbo Shaft Test Cell
211 83	Turbo Fan Test Cell
211 83	Pneumatic Gas/Air Turbine Test Cell

211 84	Helicopter Blade Test Facility
211 85	Radome Test Facility
211 86	Radar/Antenna Test Facility
211 87	Aircraft Bore Sight Range

211-2.9 **Other.** These are areas used to perform productive work that are not included in the eight Categories listed above. This includes ramp, apron, and aircraft storage sites. Typical facilities associated with the Other Production Shop and their associated Navy Category Codes are:

211 91	Aircraft Rework Apron
211 91	Reclamation Apron
211 91	Armament and Disarmament Pad
211 91	Predock/Postdock Apron
211 91	Aircraft Corrosion Control Facility (Uncovered)
211 91	Ground Check/Flight Test Support (Uncovered)
211 92	Ground Check/Flight Test Support (Covered)
211 93	Material Handlers/Parts Expeditors
211 93	Material Control Laboratory
211 93	Standards Laboratory
211 93	Automatic Test Equipment and Numerical Controlled Machine
211 94	Power Check Pad (Without Sound Suppression)
211 94	Power Check Pad (With Sound Suppression)
211 94	Propeller Aircraft Power Check Pad
211 94	Helicopter Aircraft Power Check Pad
211 94	VSTOL Aircraft Power Check Pad
211 95	Packaging and Preservation
211 98	Aircraft Power Check Facility (Covered with Sound Suppression)

### 211-3 ADDITIONAL MAINTENANCE FACILITIES

Additional air-related maintenance facilities are tabulated under the following category codes:

116 10	Airfield Washrack Pavement
116 15	Aircraft Rinse Facility
116 65	Tactical Van Support Pad
212 30	Missile Assembly and Test Building
214 30	Refueling Vehicle Shop
216 55	Air/Underwater Weapons Shop
218 50	Battery Shop
218 60	Aircraft Ground Support Equipment Shop
218 61	Ground Support Equipment Holding Shed

#### 211-4 AIRCRAFT LOADING

The primary planning factors in determining the size of maintenance facilities are the number of aircraft and spare components that the facility is required to support. Due to the size and complexity of modern test and support equipment, a repair station can be significantly larger than the number of personnel needed to operate it. The following planning factors have taken this into account and are developed accordingly.

When planning aircraft maintenance facilities for a given installation, the number of aircraft and squadrons to be counted is determined by projecting peak scheduled occupancy of all aircraft for which the station will have an aircraft maintenance support mission. Peak scheduled occupancy is defined as the maximum number of aircraft that are scheduled for simultaneous assignment at the installation for the planned construction year.

In May 2003, the Navy developed a new inter-deployment readiness profile, the “Fleet Readiness Concept” (FRC) with the goal of improving the Navy’s speed of response to world events. The FRC developed into the Fleet Response Plan (FRP). FRP was fully implemented in mid-2004, and will modify current ship and squadron operating cycles by adjusting maintenance intervals, along with training and manpower processes, to increase unit availability for surge operations – that is, building the long-term institutional capability to support rapid, massive build-up in deployed Naval forces.

FRP will alter Aircraft Carrier Battle Group/Aircraft Carrier Strike Group deployment cycles such that all aircraft squadrons could be at their respective homebases at the same time. Therefore, the concept of “hot-racking” single-sited air wing airframes is no longer valid. When planning aircraft maintenance hangars, 100% of the squadrons must be allotted space.

In some instances, an installation may be assigned the intermediate maintenance responsibility for aircraft not permanently assigned to the installation. In this case, these aircraft should be added to the base loading for the planning of intermediate maintenance shops.

#### 211-5 AIRCRAFT MAINTENANCE DEPARTMENT OFFICES

The shops comprising the Intermediate Maintenance Facility may be established separately or grouped together in a consolidated complex. Space requirements for each individual shop having a specific category code include the administrative and training space for that shop. In addition, administrative and training spaces are required for the Navy’s Aircraft Intermediate Maintenance Department (AIMD) or the Marine Corps Intermediate Maintenance (IM) offices, preferably in a centrally located administrative building within the maintenance complex. When shops are not consolidated into a complex, consideration shall be given to enlarging the administrative

space in one of the intermediate shops to provide space for the AIMD offices. Space allocations shall be made in accordance with Category Code 211-16, Aircraft Intermediate Maintenance Activity Management.

**211-6            MARINE CORPS CRITERIA**

Marine Corps aircraft facilities are planned utilizing the basic criteria for comparable Naval facilities.

211 01 AIRCRAFT ENGINE TEST CELL BUILDING (NON-NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2114**

**BFR Required: Y**

**Design Criteria:** UFC 4-212-01, Navy Standard Jet Engine Test Cells

21101-1 **GENERAL.** During the aircraft maintenance and testing process, aircraft engines are run-up while aboard the aircraft (in-frame testing) and when removed from the aircraft (out-of-frame testing). In both cases, high noise levels are generated in surrounding areas unless sound abatement is provided. The aircraft acoustical enclosure, sometimes referred to as a hush house, is a total enclosure for fixed wing aircraft designed to abate noise during in-frame run-up of jet engines. The facility consists of a hangar-like aircraft enclosure, an absorptive augments for inducing cooling air and absorbing noise, a 45-degree blast deflector, an observation room with lavatory, and a mechanical equipment room. The observation and mechanical rooms are located adjacent to, not within, the aircraft enclosure.

21101-2 **POLICY.** This Category Code shall be used for acoustical enclosures, which support organizational and intermediate level aircraft maintenance. Enclosures at Naval Air Depots (NAVAIR Depots) supporting depot maintenance shall be Category Code 211 98, Aircraft Acoustical Enclosure (NAVAIR Depot).

For out-of-frame testing see Category Code 211 81, Engine Test Cell (Non-NAVAIR Depot); Category Codes 211 88, Power Check Pad (with Sound Suppression); or 211 89, Power Check Pad (without Sound Suppression).

21101-3 **CRITERIA.** The design of the acoustical enclosure is governed by the size of aircraft and the number and location of the engines.

The acoustical enclosure provides a better working environment than open pads by providing protection from inclement weather and cross winds which adversely affect testing of engines, while at the same time significantly reducing exterior noise levels. NAVFAC P-970, Planning in the Noise Environment, specifies acceptable noise levels for various land uses. Noise levels generated during engine run ups, if not abated, would restrict land use, require that sound insulation be installed in nearby buildings, or require the run up pad be located at a considerable distance from inhabited buildings. The latter results in increased fuel consumption and lost time while transiting the aircraft to and from the run up area. In addition, noise generated during run ups can result in complaints from civilian communities resulting in local pressure to restrict operations. As indicated by P-970, the total noise environment must be evaluated and the hush house considered as one possible solution to reducing noise levels. Most air installations have had detailed noise studies done as part of the Air Installation Compatibility Use Zone (AICUZ) program. AICUZ studies address solutions to noise

problems and may serve as a basis for justifying the requirements for an acoustical enclosure.

If an acoustical enclosure is justified by a detailed analysis of noise problems and potential solutions, then one (1) acoustical enclosure shall be provided for up to 140 aircraft and two (2) for up to 360 aircraft.

Three standard designs are available to support the aircraft mix set forth in Table 21101-1.

**Table 21101-1  
Aircraft Acoustical Enclosure**

Enclosure Type	Chamber Size	Augmenter Length	Aircraft Types
I	25.6 m x 21.9 m (84 ft x 72 ft)	28.9 m (95 ft)	S-3, F-14, F/A-18, A-4, A-6, A-7, T-2
II	24.4 m x 21.9 m (80 ft x 72 ft)	27.4 m (90 ft)	F-14, F/A-18, A-4, A-7, T-2 For A-6 flare Augmenter Bellmouth to 6.24 meters (20.5 feet)
III	20.7 m x 19.5 m (68 ft x 64 ft)	20.4 m (67 ft)	F/A-18, A-4, A-6, A-7, T-2

211 03 CORROSION CONTROL HANGAR (m<sup>2</sup> / SF)

**FAC: 2113**

**BFR Required: Y**

**Design Criteria:** Military Handbook (MIL-HDBK) 1028/1C, Aircraft Maintenance Facilities

21103-1 **GENERAL.** The corrosion control hangar provides space for washing, rinsing, paint stripping, corrosion removal, protective coating and painting of aircraft at the intermediate and organizational maintenance levels. The hangar along with Aircraft Washrack Pavements (Category Code 116 10) and Aircraft Rinse Facilities (Category Code 116 15) support the corrosion control program as described in NAVAIR Technical Manual NAVAIR 01-1A-509. Depot level maintenance facilities for stripping and complete repainting of aircraft shall be coded as Paint and Finishing Hangar (NAVAIR Depot) (Category Code 211 12).

The corrosion control hangar may be required at Navy and Marine Corps activities to support the OPNAV Corrosion Control Program and to meet the environmental restrictions of the local and state governments. This facility is to be available for repair of damaged paint systems only and not for complete de-paint/repaint of an entire aircraft. That function is restricted to depot level activities. Functions performed in the corrosion control facility include deicing, limited detergent washing and rinsing, paint stripping, corrosion removal, protective coating application and painting, and finish



curing and drying. The requirement for a corrosion control hangar should be endorsed by the cognizant Type Commander and NAVAIRSYSCOM prior to approval for planning purposes.

Corrosion Control facilities should consist of at least two (2) bays, one for “dirty” work such as sanding, stripping, and blasting, and one for “clean” work such as priming and painting. One “dirty” bay can support up to 135 aircraft and one “clean” bay can support up to 45 aircraft. There are two (2) corrosion control hangar facility sizes (see Table 21103-1). The small facility will support fixed wing carrier-type and rotary wing aircraft. The large facility will support patrol and transport aircraft.

Consideration must be given to industrial safety and environmental contaminants. The facility will require a laminar flow exhaust system with filtered air intake and outflow. It will require compressed air, both tool air to operate sanders, buffers, and paint guns, and breathing air for personnel. Additional support space in the facility would be required for paint mixing, hazardous material and non-hazardous material storage, gear and tool storage, non-destructive inspection, office, and for locker rooms and toilet facilities.

**Table 21103-1  
Aircraft Corrosion Control Hangar**

Facility Type	Hangar Bay (each bay)	Support Space (each facility)	Aircraft Types
Small	27.4 m x 25.5 m (90 ft x 83.5 ft) 699 m <sup>2</sup> (7,515 SF)	64.7 m x 6.9 m (212.3 ft x 22.7 ft) 446 m <sup>2</sup> (4,819 SF)	Fixed wing, Carrier-type and Rotary Wing (F/A-18, F-14, H-60, H-53, etc.)
Large	36.6 m x 46.2 m (120 ft x 151.5 ft) 1,691 m <sup>2</sup> (18,180 SF)	36.6 m x 11.7 m (120 ft x 38.3 ft) 428 m <sup>2</sup> (4,596 SF)	Patrol and Transport (P-3, C-130, etc.)

Note: Dimensions based on Facility Plates in MIL-HDBK 1028/1C for Type “A” Small and Type “B” Large Corrosion Control Hangars.

**Table 21103-2  
Aircraft Corrosion Control Hangar  
Hangar Requirements**

Aircraft Quantity	Hangar Bay “Clean”	Hangar Bay “Dirty”	Support Space
Up to 45	1	1	1
46 – 90	2	1	1
91 – 135	3	1	1
136 – 180	4	2	1
181 – 225	5	2	1

Aircraft Quantity	Hangar Bay "Clean"	Hangar Bay "Dirty"	Support Space
226 – 270	6	2	1

211 04 PRE-ENGINEERED MAINTENANCE HANGAR (m<sup>2</sup>/ SF)

**FAC: 2111**

**BFR Required: Y**

Design Criteria: Military Handbook (MIL-HDBK) 1028/1C, Aircraft Maintenance Facilities

21104-1 **GENERAL.** The pre-engineered maintenance hangar provides an austere facility for organizational level maintenance of Navy and Marine Corps aircraft. It is intended for use primarily at overseas locations, particularly those where tenure may be limited. When provided, the pre-engineered hangars are programmed in lieu of, not in addition to, the larger standard Type I and/or II hangars (Category Codes 211 05/06/07).

The pre-engineered maintenance hangar is intended for the support of a detachment size unit of from three to five aircraft. Each hangar consists of hangar bay (OH) space and limited crew/equipment (01) and administrative (02) space. Movable partitions are provided within the crew/equipment and administrative space to facilitate configuring these areas in accordance with the requirements of the occupant.

There are three (3) types of pre-engineered maintenance hangars (See Table 21104-1). The specific type of hangar to be selected is dependent on the size of aircraft to be maintained. The Type "A" pre-engineered maintenance hangar is designed primarily for fixed wing, carrier-type aircraft and helicopters. It should be noted that a Type "A" hangar may also be utilized for smaller transport aircraft with a wingspan less than 25.5 meters (85 feet). The Type "B" pre-engineered maintenance hangar is designed primarily for shore-based patrol aircraft and transport aircraft with wingspans up to 30.5 meters (100 feet). The Type "C" pre-engineered maintenance hangar is designed primarily for (K)C-130 aircraft but may also be configured to accommodate other large transport aircraft with wingspans up to 40.2 meters (132 feet).

**Table 21104-1**  
**Pre-Engineered Maintenance Hangar**

Hangar Type	Width and Depth	Gross Area	Aircraft Types
A	32.0 m x 24.4 m (90 ft x 83.5 ft)	818 m <sup>2</sup> (8,800 SF)	Fixed wing, Carrier-type and Rotary Wing. <i>Note: May also be utilized by smaller transport aircraft with wingspan less than 25.5 meters (85 feet.)</i>

Hangar Type	Width and Depth	Gross Area	Aircraft Types
B	36.6 m x 36.6 m (120 ft x 120 ft)	1,366 m <sup>2</sup> (14,700 SF)	Shore-based Patrol and Transport aircraft with wingspans up to 30.5 meters (100 feet).
C	45.7 m x 42.7 m (150 ft x 140 feet)	1,995 m <sup>2</sup> (21,466 SF)	Primarily (K)C-130 aircraft. <i>Note: May also be configured to accommodate other large transport aircraft with wingspans up to 40.2 meters (132 feet.)</i>

Note: (1) Gross Area includes Hangar Door pockets.  
(2) Dimensions based on Facility Plates in MIL-HDBK 1028/1C for Type "A", Type "B", and Type "C" Pre-Engineered Maintenance Hangars.

211 05 MAINTENANCE HANGAR – O/H SPACE (HIGH BAY) (m<sup>2</sup> / SF)

**FAC: 2111**

**BFR Required: Y**

211 06 MAINTENANCE HANGAR – 01 SPACE (SHOPS AND MAINTENANCE ADMINISTRATION) (m<sup>2</sup> / SF)

**FAC: 2112**

**BFR Required: Y**

211 07 MAINTENANCE HANGAR – 02 SPACE (OPERATIONS, TRAINING, AND ADMINISTRATION) (m<sup>2</sup> / SF)

**FAC: 6100**

**BFR Required: Y**

**Design Criteria:** UFC 4-211-01, as updated, Aircraft Maintenance Hangars, Type I and Type II, Type III, and Type IV

21105/06/07-1 **GENERAL.** Maintenance hangars are required to provide weather-protected shelter for the servicing and repair of Navy and Marine Corps aircraft at the organizational level and emergency shelter for operable aircraft. Maintenance hangar configured for a Marine Air Logistics Squadron (MALS) may provide for the servicing and repair of aircraft at the intermediate level as well as at the organizational level. See Category 211 Appendix – Marine Corps Aircraft Maintenance Facilities, in which additional special guidance is provided. The supplement is located at the end of the 211 series criteria. There are four basic types of standard modular hangars: Type I, Type II, Type III, and Type IV. These hangars each contain a high bay (OH) space, shop and maintenance (01) space, and operations, training, and administration (02) space. Each of these spaces is assigned a separate category code.

It is extremely difficult to establish specific criteria to meet the requirements of the multi-sized squadrons existing within the various commands of the Navy and Marine Corps. Sizes range from a four aircraft AEW squadron with a complement of about one

hundred seventy-five persons to a fifty or more aircraft training squadron with a complement of up to one thousand five hundred persons (including students). Accordingly, the criteria stated herein and further defined in the Unified Facility Criteria (UFC 4-211-01, as updated) "Aircraft Maintenance Hangars" depicts the Type I, Type II, Type III, and Type IV Maintenance Hangar modules developed primarily to maintain squadron facility integrity for standard size fleet squadrons. In this context, "standard size" is defined as a combination of the following factors:

1. A squadron with ten to eighteen carrier aircraft and one hundred fifty to four hundred personnel assigned.
2. A squadron with four to six carrier aircraft and one hundred twenty-five to two hundred personnel assigned.
3. A squadron with six to twelve land based patrol or large transport aircraft and one hundred fifty to four hundred personnel assigned.

In general, the size of the OH space is based on a percentage of the number of Primary Assigned Aircraft (PAA) in a squadron and the technical requirements for ensuring adequate clearances around the aircraft. Planning factors, such as number of personnel in a squadron or number of workspaces required, are used to define the 01 space and the 02 space.

All other squadrons and/or units operating aircraft are considered non-standard. Guidance for applying these criteria to both standard and non-standard size units is contained in subparagraphs 1 and 2 below.

UFC 4-211-01, as updated, contains conceptual floor plans and notional drawings for Type I, Type II, and Type III hangars.

- Type I: Primarily designed for carrier aircraft, but adaptable to meet requirements for rotary wing and various types of smaller aircraft. The 01 and 02 spaces in this type of hangar are configured for a typical strike fighter squadron, two carrier airborne early warning squadrons, two carrier electronic attack squadrons, or a helicopter antisubmarine warfare squadron.
- Type II: Primarily supports U.S. Marine Corps aviation. Hangar is designed to accommodate CH-53 helicopters, V-22 Ospreys, and C-130 Hercules aircraft. This type of hangar may also accommodate Navy variants of the C-130, V-22, and H-53 aircraft.
- Type III: Principally designed for land based patrol (P-8A) and large transport (C-40A) aircraft.

Type IV: Intended for the largest Unmanned Aircraft System (UAS), which is currently the MQ-4C Triton.

Tables 21105-1a and 21105-1b shows the standard hangar's dimensional statistics for planning purposes. See also UFC 4-211-01 Table 2-1 for all Minimum Aircraft Maintenance Bay Clearances and Table 7-1 for other standard Hangar Type dimensions and requirements.

**Table 21105-1a  
Modular Hangar Dimensional  
Statistics for Planning Purposes  
Type I Hangar**

Category Code 21105 (OH Space)	Dimension - Navy		Dimension - USMC	
	ft	m	ft	m
Width	212	64.62	270	82.30
Depth	95	28.96	95	28.96
Useable Depth <sup>(1)</sup>	75	22.86	75	22.86
Useable Width <sup>(2)</sup>	197	60.05	255	77.72
1 Module	212	64.62	270	82.30
1-1/2 Module	318	96.93	405	123.44
2 Module	424	129.24	540	164.59
2-1/2 Module	530	161.54	675	205.74
3 Module	636	193.85	810	246.89
Each Additional 1/2 Module	106	32.31	135	41.15
Category Code 21105 (OH Space)	Dimension - Navy		Dimension - USMC	
	sq. ft	sq. m	sq. ft	sq. m
Net area per module	20,140	1,871	25,650	2,317
Gross area per module <sup>(3)</sup>	22,557	2,096	28,728	2,595
Category Code 21106 (01 Space) Shop and Maintenance	Dimension - Navy		Dimension - USMC	
	sq. ft	sq. m	sq. ft	sq. m
Net area per module	14,245	1,323	20,145	1,872
Gross area per module <sup>(4)</sup>	19,658	1,826	27,800	2,583
Category Code 21107 (02 Space) - Operations, Training, and Administration	Dimension - Navy		Dimension - USMC	
	sq. ft	sq. m	sq. ft	sq. m
Net area per module	10,062	935	12,532	1,164
Gross area per module <sup>(5)</sup>	13,181	1,225	16,417	1,525

**Table 21105-1a Notes**

(1) Type I useable depth computed upon the requirement for a 10-foot (3.05 meter) clearance from aircraft to nearest fixed obstruction along rear wall of the hangar and a 10-foot (3.05 meter) clearance between aircraft and inside face of front door.

(2) Type I useable width computed upon the requirement for a 7.5 foot (2.23 meter) clearance from aircraft to nearest fixed obstruction along side wall, and 7.5 foot (2.23 meter) clearance between aircraft wing tips.

(3) 12% net-to-gross mark-up factor applied to account for wall thickness, door pockets, and other structural components.

(4) 38% net-to-gross mark-up factor applied to account for wall thickness, elevator(s), mechanical equipment spaces, structural elements, and common spaces.

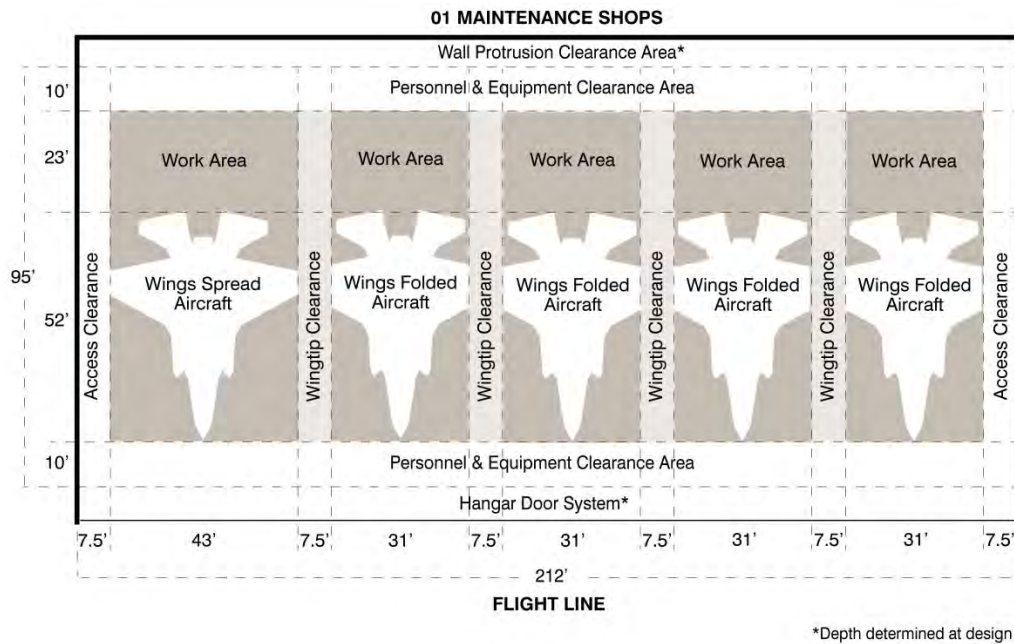
(5) 31% net-to-gross mark-up factor applied to account for wall thickness, elevator(s), mechanical equipment spaces, structural elements, and common spaces.

**Table 21105-1b  
OH Space Navy Standard  
F-35C Model  
Statistics Planning Purposes**

CATEGORY	SPACE REQ'T		PLANNING METRICS	
Required Aircraft Parking Positions	5		0.33	% of PAA + 1
<b>TOTAL WIDTH</b>	212	LF		
Aircraft with Wings Spread	43	LF	43	F35C Aircraft Width with Wings Spread
Aircraft with Wings Folded (4 X 31')	124	LF	31	F35C Aircraft Width with Wings Folded
Wingtip Clearance (4 X 7.5')	30	LF	7.5	Clearance between Aircraft
Access Clearance (2 X 7.5')	15	LF	7.5	Clearance from Side Wall (Unusable)
<b>TOTAL DEPTH</b>	95	LF		
Aircraft Length	52	LF	52	Aircraft Length
Work Area Length	23	LF	23	Work Area
Personnel & Equipment Clearance	10	LF	10	Hangar Door Clearance (unusable)
Personnel & Equipment Clearance	10	LF	10	Back Wall Clearance (unusable)
NET OH SPACE	20,140	SF		
GROSS AREA	22,557	SF	1.12	OH SPACE Net-to-Gross (NTG)

**Key:**  Variable, depends on PAA and squadron  Standard PAA and squadron  Calculation

FIGURE 1. OH Space Diagram – F35C



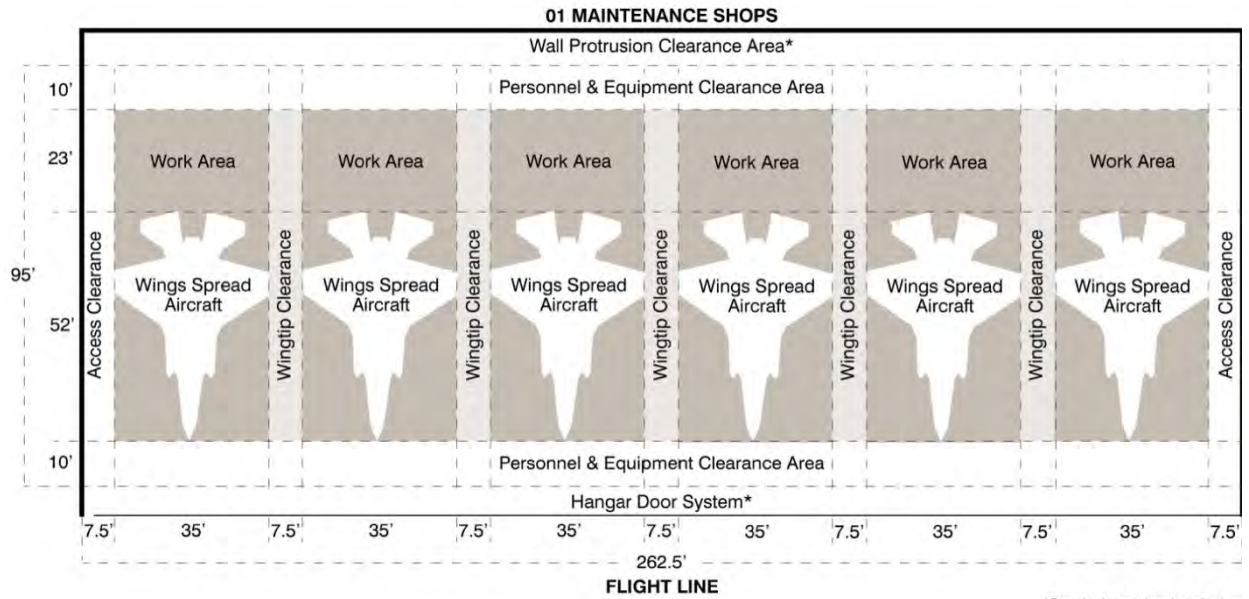
**Table 21105-1c**  
**OH Space Marine Corps Standard**  
**F-35B Model**  
**Statistics Planning Purposes**

CATEGORY	SPACE REQ'T		PLANNING METRICS	
Required Aircraft Parking Positions	6		0.33	% of PAA + 1
<b>TOTAL WIDTH</b>	262.5	LF		
Aircraft with Wings Spread (6 X 35')	210	LF	35	F35B Aircraft Width with Wings Spread
Total Wingtip Clearance (5 X 7.5')	37.5	LF	7.5	Clearance between Aircraft
Access Clearance (2 X 7.5')	15	LF	7.5	Clearance from Side Wall (Unusable)
<b>TOTAL DEPTH</b>	95	LF		
Aircraft Length	52	LF	52	Aircraft Length
Work Area Length	23	LF	23	Work Area
Personnel & Equipment Clearance	10	LF	10	Hangar Door Clearance (unusable)
Personnel & Equipment Clearance	10	LF	10	Back Wall Clearance (unusable)
NET OH SPACE	24,938	SF		
GROSS AREA	27,930	SF	1.12	OH SPACE Net-to-Gross (NTG)

**Key:**  Variable, depends on PAA and squadron  Standard PAA and squadron  Calculation



FIGURE 2. OH Space Diagram – F35B



\*Depth determined at design

**Table 21105-1d  
Modular Hangar Dimensional  
Statistics for Planning Purposes  
Type II and Type III Hangar**

Category Code 21105 Hangar Module (OH)	Type II		Type III	
	ft	m	ft	m
Width	325	99.10	165	50.30
Depth	119	36.28	165	50.30
Clear Height	44	12.80	50	14.02
Useable Depth <sup>(1)</sup>	99	30.18	130	39.63
Useable Width <sup>(2)</sup>				
1 Module	305	92.99	125	38.11
1-1/2 Module	467	142.38	n/a	n/a
2 Modules	630	192.07	290	88.41
2-1/2 Modules	792	241.46	n/a	n/a
3 Modules	955	291.16	455	138.72
3-1/2 Modules	1,117	340.55	n/a	n/a
4 Modules	1,280	390.24	620	189.02
4-1/2 Modules	1,462	445.73	n/a	n/a
5 Modules	1,605	489.33	785	239.33
5-1/2 Modules	1,747	532.62	n/a	n/a
6 Modules	1,930	588.41	950	289.63
Each Add'n 1/2 Module	162	49.54	n/a	n/a
Category Code 21105 Hangar Module (OH)	Type II		Type III	
	sq.ft.	m <sup>2</sup>	sq.ft.	m <sup>2</sup>
Net Area per Module	38,675	3,593.03	27,225	2,529.29
Gross Area per Module <sup>(3)</sup>	40,609	3,772.70	28,586	2,655.73
Category Code 21106 Shop and Maintenance Admin. (01)	Type II		Type III	
	sq.ft.	m <sup>2</sup>	sq.ft.	m <sup>2</sup>
Gross Area per Module <sup>(4)</sup>	12,000	1,114.84	12,000	1,114.84
Category Code 21107 Operations, Training, and Administration(02)	Type II		Type III	
	sq.ft.	m <sup>2</sup>	sq.ft.	m <sup>2</sup>
Gross Area per Module	12,000	1,114.84	12,000	1,114.84

**Table 21105-1b Notes**

(1) Type II useable depth computed upon the requirement for a 10-foot (3.05 meter) clearance from aircraft to nearest fixed obstruction along rear wall of the hangar and a 10-foot (3.05 meter) clearance from aircraft to inside face of front door. Type III useable depth computed upon the requirement for a 20-foot (6.10 meter) clearance from aircraft to nearest fixed obstruction along rear wall of the hangar and a 15-foot (4.57 meter) clearance between aircraft and inside face of front door.

(2) Type II useable width computed upon the requirement for a 10-foot (3.05 meter) work clearance from aircraft to nearest fixed obstruction along side wall. Type III useable width computed upon the requirement for a 20-foot (6.10 meter) work clearance from aircraft to nearest fixed obstruction along side wall.

(3) 5% net-to-gross mark-up factor applied to account for wall thickness and other structural loss. Additional net-to-gross mark-up may be required for hangars utilizing enclosed door pockets.

(4) Excludes an allowance of up to 1,536 sq. ft. (143 m<sup>2</sup>.) for mechanical equipment space to house Aqueous Fire Foam Film (AFFF) fire suppression systems.

Due to the different attributes of the functions performed in the three space types, separate net-to-gross (NTG) ratios are provided for each space type in a Type I maintenance hangar:

- Hangar Bay (OH Space) – 1.12
- Shops and Maintenance (01 Space) – 1.38
- Operations, Training, and Administration (02 Space) – 1.31

21105/06/07-2 **Guidelines for Applying Maintenance Hangar Criteria.**

In the application of the criteria for the planning of Maintenance Hangars, the following guidelines are established:

21105/06/07-2.1 **Category Code 211-05 – OH Space.**

- (1) One Type I standard hangar module OH space will be planned for each standard size squadron with twelve to eighteen carrier aircraft.
- (2) One half a Type I standard hangar module OH space will be planned for each standard size squadron with four to six carrier aircraft.
- (3) One Type II standard hangar module OH space will be planned for each standard size squadron with ten to sixteen large helicopter or tilt-rotor aircraft.
- (4) One Type III standard hangar module OH space will be planned for each standard size squadron with four to eight land based patrol or large transport aircraft.
- (5) The aircraft assigned to all other squadrons or units located on an air station or air facility, including pool or station aircraft, will be combined into a total loading, and the number of hangar modules required for these aircraft will be determined as follows:

Hangar space requirements for both scheduled and unscheduled maintenance vary by aircraft due to maintenance complexity and mission requirements. Carrier and rotary wing aircraft require more maintenance than patrol, special mission, and training aircraft, which require more maintenance than transport aircraft. Carrier and rotary wing aircraft normally require removing skin panels to gain access to Weapons Replaceable Assemblies (WRA). On patrol, special mission, and training aircraft a larger percentage of WRAs are readily accessible from the interior of the aircraft and, therefore, more maintenance is performed on the flight line (parking apron). In general, transport aircraft are less complex and

require less hangar space. Consequently, hangar space requirements should be planned as follows (See Table 21105-2 for details):

- (a) OP-Carrier, OP-Rotary, OP-Tilt-Rotor, TRG-Rotary, TRG-Carrier, TRG-Tilt-Rotor, RES-Rotary, RES-Carrier type squadrons: One (1) hangar space for every three (3) aircraft assigned.
- (b) OP-Patrol, OP-Special Mission, TRG-Patrol, TRG-New Pilot, TRG-Special Mission, OTH(N)-SAR, OTH(N)-Station, OTH(N)-NTPS, OTH(N)-NSAWC, OTH(MC)-Station, RES-Patrol, RES-Station, RES-Special Mission type squadron: One (1) hangar space for every six (6) aircraft assigned.
- (c) RES -Transport type squadron: One (1) hangar space for every nine (9) aircraft assigned.
- (d) OP-UAS (BAMS Only) and TRG-UAS (BAMS Only) type squadrons: One (1) hangar space for every two (2) aircraft assigned.
- (e) ETD type squadron: Due to the unique and critical nature of the mission, one (1) hangar space per aircraft assigned
- (f) RDT&E type squadron: Hangaring requirements vary based on aircraft testing configuration. See Category Code 311-05, 311-06, and 311-07.

OP = Operational

TRG = Training

OTH(N) = Other, Navy

NSAWC = Naval Strike and Air Warfare Center

OTH(MC) = Other, Marine Corps

RES = Reserve

RDT&E = Research, Development, Testing and Evaluation

SAR = Search and Rescue

NTPS = Navy Test Pilot School

ETD = Executive Transport

#### **FOR FIXED WING AIRCRAFT:**

Except for Type I hangar (see Table 21105-1a) or special cases, hangar requirements are computed with a distance of 1.52 meters (5 feet) between aircraft and with the aircraft wings folded.

FOR ROTARY WING AIRCRAFT:

Except for Type I hangar (see Table 21105-1a) or special cases, hangar requirements are computed with a distance of 1.52 meters (5 feet) between aircraft and with seventy-five (75) percent of the aircraft with rotors folded. Twenty-five (25) percent of the aircraft are maintained with the rotors in the spread mode.

FOR SPECIAL CASES:

Some aircraft require greater separation distances between parked aircraft to accommodate maintenance equipment as well as proper ingress/egress aisles. These aircraft include the MV-22 and P-8A (MMA).

FOR MV-22 AIRCRAFT:

Hangar requirements are computed with a distance of 3.05 meters (10 feet) between aircraft and with seventy-five (75) percent of the aircraft with wings/rotors spread. Twenty-five (25) percent of the aircraft are maintained with the wing/rotors in the folded mode.

FOR P-8A AIRCRAFT:

Hangar requirements are computed with a distance of 5.18 meters (17 feet) between aircraft.

Tables 21105-2 and 21105-3 provide aircraft widths, hangar space requirements ratios, and type hangar for each aircraft.

OH space in hangars represents the hangar high bay space. While the OH space is intended primarily to provide squadron-level maintenance (organizational or O-level), it is expected that a hangar bay could include an additional space designated for Planned Maintenance Interval (PMI). Naval Aviation Maintenance Program (NAMP) defines PMI as period of time for execution of an Integrated Maintenance Concept/Program (IMC/P) or Phased Depot Maintenance. While PMI can include O-level, intermediate-level (I-level), and depot-level (D-level) actions, the PMI space in a hangar bay is necessary to provide D-level maintenance at an air installation as O-level maintenance is already accounted for elsewhere in the hangar bay and I-level maintenance is generally performed off-aircraft and does not require a hangar spot. Depot-level maintenance is defined as maintenance performed on material requiring major overhaul or rebuilding of parts, assemblies, subassemblies, and end items. This type of maintenance includes manufacturing parts, making modifications, testing,

inspecting, sampling, and reclamation. PMI D-level actions may include major structural repair involving removal and replacement of frames, bulkheads, and frames, along with full H-60 strip and paint.

PMI hangars need to be planned for each Type/Model/Series (TMS) by Commander, Fleet Readiness Center (COMFRC). A designated PMI space within an operational-level hangar bay is only required if PMI D-level maintenance actions under the IMC/P cannot be satisfied by COMFRC with other D-level maintenance space available elsewhere. Input from Commander Naval Air Atlantic/Pacific is necessary for an accurate assessment of the PMI space requirement.

To support this evolution in maintenance functions, the required hangar modules will be calculated using the following methodology:

- First, the product of the PAA and the hangar ratio (hangar ratios are shown in Table 21105-2) will be rounded up to the next integer for any values ending with a fraction of 0.3 or above for the Navy. For the USMC, rounding will follow conventional method (i.e., numbers with a fraction of 0.5 or more will be rounded up to the next integer). The figure will be rounded down otherwise;
- Second, the calculated hangar modules will be normalized up to the next 0.5 module to determine the required hangar modules.

This methodology is expected to provide additional hangar spaces for PMI at Navy/USMC installations. For Navy hangars, if an additional designated space is required for PMI, one more space with spread configuration will be provided per Type/Model/Series per installation. This additional requirement must be verified with Commander, Naval Air Force Command (CNAF).

Sensitive Compartmented Information Facility (SCIF)/Special Access Program – Facility (SAP-F): SCIF/SAP-F requirements are design features in DOD ICD 705 incorporated in various functional spaces to allow for the dissemination of sensitive information. Spaces in the 01 and 02 functional areas may require SCIF design features. The mission of the squadron determines whether or not certain spaces in the 01 and 02 functional areas require SCIF design features. SCIF design features typically include shielding of walls, floors, ceilings, and doors; and secure systems such as security, telephone, network, electrical, and room acoustics.

**Table 21105-2  
Navy and Marine Corps Squadron Types  
with  
Aircraft and Aircraft Designations**

Acronym	Squadron Designation	Aircraft TMS	Squadron Type	Hangar Ratio
<b>Operational Squadrons – Navy</b>				
HS	Helicopter Antisubmarine Squadron	HH-60H SH-60F	OP – Rotary	1/3
HSC	Helicopter Sea Combat Squadron	HH-60H MH-60S SH-60F	OP – Rotary	1/3
HM	Helicopter Mine Countermeasures Squadron	MH-53E	OP - Rotary	1/3
HSL	Helicopter Antisubmarine Squadron (Light)	SH-60B SH-60F	OP - Rotary	1/3
HSM	Helicopter Maritime Strike Squadron	MH-60R	OP - Rotary	1/3
VAQ	Carrier Tactical Electronics Warfare Squadron or Tactical Electronics Warfare Squadron	EA-6B EA-18G	OP - Carrier	1/3
VAW	Carrier Airborne Early Warning Squadron	E-2C E-2D	OP - Carrier	1/3
VFA	Strike Fighter Squadron	F/A-18A F/A-18B F/A-18C F/A-18D F/A-18E F/A-18F JSF	OP - Carrier	1/3
VP	Patrol Squadron	P-3C	OP - Patrol	1/6
		P-8A		Note 1
VPU	Patrol Squadron Special Unit	P-3C	OP - Special Mission	1/6
VQ	Fleet Air Reconnaissance Squadron	P-3C EP-3E	OP - Special Mission	1/6
		EPX E-6B	OP - Special Mission	1/6
VRC	Fleet Logistics Support Squadron	C-2A	OP - Carrier	1/3
VS	Sea Control Squadron	S-3B	OP - Carrier	1/3
BAMS	Broad Area Maritime Surveillance Squadron	UAS	OP – UAS	1/2
TUAV	Tactical Unmanned Aerial Vehicle Squadron	MQ-8B	OP - UAS	TBD

Acronym	Squadron Designation	Aircraft TMS	Squadron Type	Hangar Ratio
<b>Training Squadrons – Navy</b>				
HM (FRS)	Helicopter Mine Countermeasures Squadron (Fleet Replacement Squadron)	MH-53E	TRG – Rotary	1/3
HS (FRS)	Helicopter Antisubmarine Squadron (Fleet Replacement Squadron)	HH-60H SH-60F	TRG – Rotary	1/3
HSC (FRS)	Helicopter Sea Combat Squadron (Fleet Replacement Squadron)	HH-60H MH-60S SH-60F	TRG - Rotary	1/3
HSL (FRS)	Helicopter Antisubmarine Squadron (Light) (Fleet Readiness Squadron)	SH-60B	TRG - Rotary	1/3
HSM (FRS)	Helicopter Maritime Strike Squadron (Fleet Replacement Squadron)	MH-60R	TRG - Rotary	1/3
JSFTS	Joint Strike Fight Training Squadron	F-35C	TRG - Carrier	1/3
VAQ (FRS)	Carrier Tactical Electronics Warfare Squadron or Tactical Electronics Warfare Squadron (Fleet Replacement Squadron)	EA-6B EA-18G	TRG - Carrier	1/3
VAW (FRS)	Carrier Airborne Early Warning Squadron and Fleet Logistics Support Squadron (Fleet Replacement Squadron)	E-2C E-2D C-2A TE-2C	TRG - Carrier	1/3
VFA (FRS)	Strike Fighter Squadron (Fleet Replacement Squadron)	F/A-18A F/A-18B F/A-18C F/A-18D F/A-18E F/A-18F T-34C	TRG - Carrier	1/3
VP (FRS)	Patrol Squadron (Fleet Readiness Squadron)	P-3C	TRG – Patrol	1/6
		P-8A		Note 1
BAMS (FRS)	Broad Area Maritime Surveillance (Fleet Replacement Squadron)	UAS	TRG – UAS	1/2
EPX (FRS)	Fleet Air Reconnaissance Squadron (Fleet Replacement Squadron)	TBD	TRG - Special Mission	1/6
HT	Helicopter Training Squadron	TH-57B TH-57C TH-57D	TRG – New Pilot	1/6
VT	Training Squadron	T-2C	TRG – New Pilot	1/6
		T-34C		1/6
		T-39G		1/6
		T-39N		1/6
		T-44A		0.28 (Note 2)
		T-44C		0.28 (Note 2)
		T-45A		1/6
		T-45C		1/6
		T-6A		0.39 (Note 2)
		T-6B		0.39 (Note2)
		TC-12B		1/6



Acronym	Squadron Designation	Aircraft TMS	Squadron Type	Hangar Ratio
<b>Other – Navy</b>				
N/A	Search and Rescue	SH-60F MH-60S	OTH(N) – SAR	1/6
N/A	Station Support Aircraft	C-26D MH-60S SH-60F T-34C UC-12B UC-12F UC-12M	OTH(N) – Station	1/6
NTPS	Navy Test Pilot School	C-12C F/A-18B F/A-18F NP-3D NU-1B NSH-60B OH-58C T-6A T-6B TH6REP U-6A UH-60L X-26A	OTH(N) – NTPS	1/6
NSAWC	Naval Strike and Air Warfare Center	E-2C E-2D F-16A F-16B F-35C F/A-18A F/A-18B F/A-18C F/A-18D F/A-18E F/A-18F MH-60S	OTH(N) – NSAWC	1/6
<b>Operational Squadrons – Marine Corps</b>				
HMH	Marine Heavy Helicopter Squadron	CH-53D CH-53E CH-53K	OP - Rotary	1/3
HMLA	Marine Light Attack Helicopter Squadron	AH-1W AH-1Z UH-1Y	OP - Rotary	1/3
HMM	Marine Medium Helicopter Squadron	C-46E	OP - Rotary	1/3
HMX	Marine Helicopter Squadron	CH-46E VH-3D VH-60N VH-71A	OP-Rotary	1/3

		VH-71B		
		CH-53E	OP-Rotary	1/3
		MV-22B	OP-Tilt-Rotor	1/3
VMA	Marine Attack Squadron	AV-8B	OP – Carrier	1/3
VMAQ	Marine Tactical Electronics Warfare Squadron	EA-6B	OP – Carrier	1/3
VMFA	Marine Fighter Attack Squadron	F/A-18A F/A-18C JSF	OP – Carrier	1/3
VMFA(AW)	Marine All-Weather Fighter Attack Squadron	F/A-18C F/A-18D JSF	OP – Carrier	1/3
VMGR	Marine Aerial Refueler Transport Squadron	KC-130J KC-130R	OP – Special Mission	1/6
VMM	Marine Medium Tilt-Rotor Squadron	MV-22B	OP – Tilt-Rotor	1/3
<b>Training Squadrons – Marine Corps</b>				
VMAT	Marine Attack Training Squadron	AV-8B TAV-8B	TRG – Carrier	1/3
HMLAT	Marine Light Attack Helicopter Training Squadron	AH-1W AH-1Z HH-1N UH-1N UH-1Y	TRG – Rotary	1/3
HMMT	Marine Medium Helicopter Training Squadron	C-46E	TRG – Rotary	1/3
HMT	Marine Helicopter Training Squadron	CH-53E CH-53K	TRG – Rotary	1/3
VMAQ	Marine Tactical Electronics Warfare Squadron	EA-6B	TRG – Carrier	1/3
JSFTS	Joint Strike Fighter Training Squadron	F-35B(JSF)	TRG – Carrier	1/3
VMFAT	Marine Fighter Attack Training Squadron	F/A-18A F/A-18B F/A-18C F/A-18D T-34C	TRG – Carrier	1/3
HMLAT	Marine Light Attack Helicopter Training Squadron	AH-1W AH-1Z HH-1N UH-1N UH-1Y	TRG - Rotary	1/3
VMGR (FRS)	Marine Aerial Refueler Transport Squadron	KC-130R	TRG – Special Mission	1/6
VMMT	Marine Medium Tiltrotor Training Squadron	MV-22B	TRG – Tilt-Rotor	1/3
<b>Other - Marine Corps</b>				
N/A	Station Support	HH-1N UH-1Y	OTH(MC) - Station	1/6

Acronym	Squadron Designation	Aircraft TMS	Squadron Type	Hangar Ratio
<b>Reserve Force – Navy</b>				
HSC	Helicopter Sea Combat Squadron	HH-60H MH-60S	RES - Rotary	1/3

Acronym	Squadron Designation	Aircraft TMS	Squadron Type	Hangar Ratio
HM	Helicopter Mine Countermeasures Squadron	MH-53E	RES - Rotary	1/3
HSL	Helicopter Antisubmarine Squadron (Light)	SH-60B	RES - Rotary	1/3
HSM	Helicopter Maritime Strike Squadron	MH-60R	RES - Rotary	1/3
VAQ	Carrier Tactical Electronics Warfare Squadron or Tactical Electronics Warfare Squadron	EA-6B	RES - Carrier	1/3
VAW	Carrier Airborne Early Warning Squadron	E-2C	RES - Carrier	1/3
VFA	Strike Fighter Squadron	F/A-18A	RES - Carrier	1/3
VFC	Fighter Squadron Composite	F-5F F-5N F/A-18C JSF	RES - Carrier	1/3
VP	Patrol Squadron	P-3C	RES - Patrol	1/6
VR	Fleet Logistics Support Squadron	C-130T C-20D C-20G C-37B C-40A C-9B DC-9	RES - Transport	1/9
ETD	Executive Transport	C-20A C-37A	RES - Transport	1/1
N/A	Miscellaneous Station Support	UC-12B	RES - Station	1/6

Acronym	Squadron Designation	Aircraft TMS	Squadron Type	Hangar Ratio
<b>Reserve Force – Marine Corps</b>				
HMLA	Marine Light Attack Helicopter Squadron	AH-1W AH-1Z UH-1N UH-1Y	RES - Rotary	1/3
HMM	Marine Medium Helicopter Squadron	CH-46E	RES - Rotary	1/3
HMH	Marine Heavy Helicopter Squadron	CH-53E	RES - Rotary	1/3
VMFA	Marine Fighter Attack Squadron	F/A-18A F/A-18C JSF	RES - Carrier	1/3
VMFT	Marine Fighter Training Squadron (Adversary)	F-5F F-5N	RES - Carrier	1/3
VMGR	Marine Aerial Refueler Transport Squadron	KC-130J KC-130T	RES - Special Mission	1/6
VMM	Marine Medium Tiltrotor Squadron	MV-22B	RES - Rotary	1/3
VMR	Marine Transport Squadron	C-20G C-9B HH-46E UC-12B UC-12F UC-35C	RES - Transport	1/9

Acronym	Squadron Designation	Aircraft TMS	Squadron Type	Hangar Ratio
		UC-35D		
N/A	Station Support Aircraft	UC-12B	RES - Station	1/6

**Note**

1. Based on scheduled maintenance loading of 48% and unscheduled maintenance loading of 52% P-8A VP squadrons experienced over the 4-year period ending 2019, the effective hangar ratio is determined to be to  $\frac{1}{4}$ , or 0.25. This ratio applies as an interim update (Source: PMA-290 criteria inquiry dated 21 February 2020).
2. Based on updated maintenance records submitted by Commander, Naval Training Command (CNATRA) with a criteria update request of December 2020.

**Table 21105-3  
Aircraft Widths and  
Hangar Space Requirements**

Aircraft TMS	Hangar Type	Width Wings Spread (meters)	Width Wings Spread (ft-in)	Width Wings Folded (meters)	Width Wings Folded (ft-in)	Overall Height (meters)	Overall Height (ft-in)	Length (meters)	Length (ft-in)
AH-1W	I	14.63	48-0	3.28 <sup>(2)</sup>	10-9 <sup>(2)</sup>	4.32	14-2	17.68	58-0
AH-1Z	I	14.48	47-6	4.60 <sup>(2)</sup>	15.1 <sup>(2)</sup>	4.37	13-6	13.87	45-6
AV-8B	I	9.25	30-4	N/A	N/A	3.55	11-7	14.13	46-4
BAMSUAS	II	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
C-12C	I	16.62	54-6	N/A	N/A	4.57	15-0	13.36	43-10
C-130T	II	40.40	132-7	N/A	N/A	11.69	38-4	29.83	97-10
C-20A	II	23.72	77-10	N/A	N/A	7.47	24-6	25.56	83-10
C-20D	II	23.72	77-10	N/A	N/A	7.47	24-6	25.56	83-10
C-20G	II	23.72	77-10	N/A	N/A	7.47	24-5	26.96	88-5
C-26D	I	17.38	57-0	N/A	N/A	5.09	16-8	18.11	59-5
C-2A	I	24.56	80-7	10.80 <sup>(1)</sup>	35-5 <sup>(1)</sup>	5.18	17-0	17.56	57-7
C-37A	II	28.50	93-6	N/A	N/A	7.90	25-10	29.39	96-5
C-37B	II	28.50	93-6	N/A	N/A	7.90	25-10	29.39	96-5
C-40A	III	35.8	117-5	N/A	N/A	12.55	41-2	33.64	110-4
C-9B	II	28.43	93-3	N/A	N/A	8.36	27-5	36.38	119-4
CH-46E	I	15.54	51-0	4.50 <sup>(2)</sup>	14-9 <sup>(2)</sup>	5.09	16-8	25.71	84-4
CH-53D	II	22.01	72-2.7	7.29 <sup>(2)</sup>	23-11 <sup>(2)</sup>	7.60	24-11	20.55	67-5
CH-53E	II	24.08	79-0	8.66 <sup>(2)</sup>	28-5 <sup>(2)</sup>	7.19	23-7	30.18	99-0
CH-53K	II	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
DC-9	II	28.43	93-3	N/A	N/A	8.36	27-5	36.38	119-4
E-2C	I	24.56	80-7	10.80 <sup>(1)</sup>	35-5 <sup>(1)</sup>	5.58	18-3.75 <sup>(4)</sup>	17.53	57-6
E-2D	I	24.56	80-7	10.80 <sup>(1)</sup>	35-5 <sup>(1)</sup>	5.58	18-3.75 <sup>(4)</sup>	17.53	57-6
E-6B	N/A	45.21	148-4	N/A	N/A	12.93	42-5	45.83	150-4
EA-18G	I	13.69	44-11	9.96	32-8	4.89	16-0	18.31	60-1.25
EA-6B	I	16.15	53-0	7.60	24-11	5.08 <sup>(5)</sup>	16-8 <sup>(5)</sup>	18.24	59-10
EP-3E	II	30.33	99-6	N/A	N/A	10.24	33-7	35.54	116-7
EPX	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD
F-16A	I	9.93	32-7	N/A	N/A	5.06	16-7	15.09	49-6
F-16B	I	9.93	32-7	N/A	N/A	5.06	16-7	15.09	49-6
F-35A	I	10.67	35-0	N/A	N/A	4.33	14-3	15.40	50-6
F-35B	I	10.67	35-0	N/A	N/A	4.31	14-2	15.40	50-6
F-35C	I	13.11	43-0	9.54	31-3	4.42	14-6	15.50	50-10
F-5F	I	8.13	26-8	N/A	N/A	4.00	13-1	15.73	51-7
F-5N	I	8.13	26-8	N/A	N/A	4.07	13-4	14.68	48-2
F/A-18A	I	11.43	37-6	8.38	27-6	4.67	15-4	17.07	56-0
F/A-18B	I	11.43	37-6	8.38	27-6	4.67	15-4	17.07	56-0
F/A-18C	I	12.32	40-5	8.38	27-6	4.67	15-4	17.07	56-0
F/A-18D	I	12.32	40-5	8.38	27-6	4.67	15-4	17.07	56-0
F/A-18E	I	13.68	44-9	9.96	32-8	4.88	16-0	18.39	60-4

Aircraft TMS	Hangar Type	Width Wings Spread (meters)	Width Wings Spread (ft-in)	Width Wings Folded (meters)	Width Wings Folded (ft-in)	Overall Height (meters)	Overall Height (ft-in)	Length (meters)	Length (ft-in)
F/A-18F	I	13.68	44-9	9.96	32-8	4.88	16-0	18.39	60-4
GHMD	II	35.42	116-2	N/A	N/A	4.62	15-2	14.63	48-0
HH-1N	I	14.63	48-0	2.81 (2)	9-2.6 (2)	4.39	14-5	17.48	57-4
HH-46E	I	15.55	51-0	4.50 (2)	14-9 (2)	5.08	16-8	13.92	45-8
HH-60H	I	16.36	53-8	4.37 (2)	14-4 (2)	5.18	17-0	14.25	46-9
KC-130F	II	40.41	132-7	N/A	N/A	11.71	38-5	29.80	97-9
KC-130J	II	40.41	132-7	N/A	N/A	11.71	38-5	29.80	97-9
KC-130R	II	40.41	132-7	N/A	N/A	11.71	38-5	29.80	97-9
KC-130T	II	40.41	132-7	N/A	N/A	11.71	38-5	29.80	97-9
MH-53E	II	24.08	79-0	8.41 (2)	27-7 (2)	8.64	28-4	30.18	99-0
MH-60R	I	16.36	53-8	4.37 (2)	14-4 (2)	5.13	16-10	19.74	64-9
MH-60S	I	16.36	53-8	4.37 (2)	14-4 (2)	5.10	16-8	19.74	64-9
MQ-8B	I	8.38	27-6	1.88 (2)	6-2 (2)	2.87	9-5	9.60	31-6
MV-22B	II	25.82 (3)	84-7 (3)	5.61 (3)	18-5 (3)	6.73 (6)	22-1 (6)	17.50	57-4
NC-130H	II	40.41	132-7	N/A	N/A	11.71	38-5	29.80	97-9
NF/A-18C	I	12.32	40-5	8.38	27-6	4.67	15-4	17.07	56-0
NF/A-18D	I	12.32	40-5	8.38	27-6	4.67	15-4	17.07	56-0
NP-3C	II	30.38	99-8	N/A	N/A	10.26	33-8	35.61	116-9
NP-3D	II	30.38	99-8	N/A	N/A	10.26	33-8	35.61	116-9
NU-1B	I	17.68	58-0	N/A	N/A	3.79	12-5	12.75	41-10
NAV-8B	I	9.25	30-4	N/A	N/A	3.55	11-7	14.13	46-4
NC-12B	I	16.62	54-6	N/A	N/A	4.57	15-0	13.34	43-9
NSH-60B	I	16.36	53-8	4.37 (2)	14-4 (2)	4.57	15-0	19.76	64-9
NSH-60F	I	16.36	53-8	4.37 (2)	14-4 (2)	4.57	15-0	19.76	64-9
NVH-3A	I	18.90	62-0	4.98 (2)	16-4 (2)	5.18	17-0	22.18	72-9
NVH-3D	I	18.90	62-0	4.98 (2)	16-4 (2)	5.18	17-0	21.90	73-0
OH-58C	I	10.77	35-4			2.92	9-7	12.85	42-2
P-3C	II	30.38	99-8	N/A	N/A	10.26	33-8	35.61	116-9
P-8A	III	37.96	124-6	N/A	N/A	12.86	42-2	39.48	129-6
RC-12F	I	16.62	54-6	N/A	N/A	4.57	15-0	13.36	43-10
RC-12M	I	16.62	54-6	N/A	N/A	4.57	15-0	13.36	43-10
S-3B	I	20.93	68-8	8.99	29-6	6.94	22-9	16.26	53-4
SH-60B	I	16.36	53-8	4.37 (2)	14-4 (2)	4.57	15-0	19.76	64-9
SH-60F	I	16.36	53-8	4.37 (2)	14-4 (2)	4.57	15-0	19.76	64-9
T-2C	I	11.64	38-2	N/A	N/A	4.50	14-9	11.79	38-8
T-34C	I	10.19	33-5	N/A	N/A	3.02	9-11	8.74	28-8
T-38C	I	7.70	25-3	N/A	N/A	3.92	12-10.5	14.14	46-4.5
T-39D	I	13.61	44-8	N/A	N/A	4.88	16-0	13.41	44-0
T-39G	I	13.57	44-6	N/A	N/A	4.88	16-0	13.31	43-8
T-39N	I	13.57	44-6	N/A	N/A	4.88	16-0	14.28	46-10
T-44A	I	15.32	50-3	N/A	N/A	4.37	14-4	10.82	35-6
T-44C	I	14.00	45-11	N/A	N/A	4.70	15-5	12.17	39-11
T-45A	I	9.40	30-10	N/A	N/A	4.12	13-6	11.99	39-4

Aircraft TMS	Hangar Type	Width Wings Spread (meters)	Width Wings Spread (ft-in)	Width Wings Folded (meters)	Width Wings Folded (ft-in)	Overall Height (meters)	Overall Height (ft-in)	Length (meters)	Length (ft-in)
T-45C	I	9.40	30-10	N/A	N/A	4.12	13-6	11.99	39-4
T-6A	I	10.18	33-5	N/A	N/A	3.30	10-10	10.16	33-4
T-6B	I	10.18	33-5	N/A	N/A	3.25	10-3	10.16	33-4
TAV-8B	I	9.25	30-4	N/A	N/A	3.53	11-7	11.08	36-4
TC-12B	I	16.61	54-6	N/A	N/A	4.52	14-10	13.36	43-10
TE-2C	I	24.57	80-7	N/A	N/A	5.59	18-4	17.53	57-6
TH-57B	I	10.16	33-4	1.92 (2)	6-3.5 (2)	3.05	10-0	12.09	39-8
TH-57C	I	10.16	33-4	1.92 (2)	6-3.5 (2)	3.05	10-0	12.09	39-8
TH-57D	I	10.16	33-4	1.92 (2)	6-3.5 (2)	3.05	10-0	12.09	39-8
TH-6B	I					2.30	7-6.7	9.25	30-4
TH6REP	TBD								
U-6A	I	14.63	48-0	N/A	N/A	2.74	9-0	9.24	30-4
UC-12B	I	16.61	54-6	N/A	N/A	4.52	14-10	13.36	43-10
UC-12F	I	16.61	54-6	N/A	N/A	4.52	14-10	13.36	43-10
UC-12M	I	16.61	54-6	N/A	N/A	4.52	14-10	13.36	43-10
UC-35C	I	15.90	52-2	N/A	N/A	4.57	15-0	14.91	48-11
UC-35D	I	16.46	54-0	N/A	N/A	4.62	15-2	14.91	48-11
UH-1N	I	14.63	48-0	2.81 (2)	9-2.6 (2)	4.54	14-11		
UH-1Y	I	14.88	48-10			4.50	14-7	17.78	58-4
UH-3H	I	19.00	62-0			5.13	16-10	16.70	54-9
UH-60L	I	16.36	53-8			5.13	16-10	19.76	64-10
VH-3D	I	18.90	62-0	4.98 (2)	16-4 (2)	5.13	16-10	16.70	54-9
VH-60N	I	16.36	53-8			5.13	16-10	19.76	64-10
VH-71A	I	18.59	61-0			6.65	21-10	22.81	74-10
VH-71B	I	18.59	61-0			6.65	21-10	22.81	74-10
X-26A	I	17.42	57-1.5	N/A	N/A	2.82	9-3		

Table 21105-3 Notes:

- (1) Propeller disc span, which exceeds folded wing dimension.
- (2) Minimum aircraft width with rotors in line with or folded in line with aircraft fuselage.
- (3) MV-22 aircraft has multiple stow positions: Flight Ready Position = 25.816 meters (84'7"), Fold Horizontal Position = 16.154 meters (53'0"), Fold Vertical Position = 16.495 meters (54'1"), and Full Stow Position = 5.613 meters (18'5"). Use Flight Ready Position for Wings Spread width and Full Stow Position for Wings Folded width.
- (4) Height with rotodome in raised position.
- (5) Height with wings folded. Maximum height during wing folding procedure is 6.57 meters (21'6.8"). Aircraft height with wing extended is 4.95 meters (16'3"). Group the total aircraft non-standard loading by type, model, and series and apply the following formulas to each group. Combine the results of each calculation into Type I and Type II module requirements to obtain the required hangar widths to perform both scheduled and unscheduled maintenance in each type of hangar.
- (6) Height for spread configuration. If aircraft in folded configuration then height reduced to 5.51 meters (18'1").

## Calculating OH Space

Given the standard size of the OH space described previously, when planning OH space, planners shall follow the process below for determining the number of standard hangar modules required and the gross square feet required.

### 1. *Gather data input*

Important data is necessary to select and apply correct formula to determine the number of hangar modules required. Data inputs include the following:

- Squadron service type (i.e., Navy or Marine Corps)
- Number of Primary Aircraft Authorized (PAA) for squadron
- Airframe assigned
- Width of aircraft with wings spread (for fixed-wing aircraft)
- Width of aircraft with wings folded (for fixed-wing aircraft)
- Rotor diameter when rotors are spread (for Tilt-Rotor aircraft, Rotor Spread is Flight Ready Position)
- Width of aircraft when rotors are folded or minimum aircraft width with rotors in line or folded in line with aircraft fuselage (for Tilt-Rotor aircraft Rotor Fold is Full Stow Position)

### 2. *Calculate the required hangar width (RHW) using formulas in Table 21105-4 as follows:*

Using the formulas in Table 21105-04 that includes the following variables:

N = Number of Primary Assigned Aircraft (PAA)

WS = Width of aircraft with wings spread (See Table 21105-3)

WF = Width of aircraft with wings folded (See Table 21105-3)

W = Width of aircraft for aircraft with wings that do not fold

D = Clearance between wingtips and walls or other wingtips, that is 7.5 feet

RS = Rotor diameter when rotors are spread (for Tilt-Rotor aircraft, RS is Flight Ready Position)

RF = Width of aircraft with rotors folded or minimum aircraft width with rotors in line or folded in line with aircraft fuselage (for Tilt-Rotor aircraft RF is Full Stow Position)



Table 21105-4  
Required Hangar Width Formulas

<b>Aircraft Type</b>	<b>Required Hangar Width Formula</b>
Carrier Aircraft*	$(1 \times WS) + (N/3 \times WF) + [(N/3 + 1) \times D] + WS$ (for IMP)
Rotary Wing Aircraft	$0.25 \times N/3 \times RS + 0.75 \times N/3 \times RF + [(N/3 + 1) \times D] + RS$ (for IMP)
Patrol, Special Mission, and Training Aircraft	$N/6 \times W + [(N/6 + 1) \times D] + W$ (for IMP)
Transport Aircraft	$N/9 \times W + [(N/9 + 1) \times D] + W$ (for IMP)
Tilt-Rotor Aircraft	$0.75 \times N/3 \times RS + 0.25 \times N/3 \times RF + [(N/3 + 1) \times D] + RS$ (for IMP)
Executive Transport Aircraft	$N/1 \times W + [(N/1 + 1) \times D]$

\*If an additional PMI bay is required, add space for WS and D.

\*When performing calculations for determining the number of aircraft to a hangar, the Navy will incorporate the rounding down of a number when that number is less than 0.3 and rounding up when the number is equal to 0.3 or greater.

\*For determining the number of aircraft in a hangar for the Marine Corps, use the conventional rounding method, and round up to the nearest whole number when the number is 0.5 or higher.

### 3. *Determine the number of standard modules required*

Divide the RHW by 212 feet for Navy and 262.5 feet for Marine Corps for partial modules. To determine the number of standard modules required, normalize partial modules as follows:

- (a) Less than one module, one module is required.
- (b) More than one module but equal one and one half modules, one and a half modules are required
- (c) More than one and one half module but less than two modules, two modules are required
- (d) Additional modules are determined on the same basis.

### 4. *Calculate the gross square footage (GSF) required*

Multiply the net square feet of the standard one-module hangar for either the Navy or Marine Corps by the number of standard modules required then by the 1.12 net-to-gross ratio for the GSF required.

### Sample Calculation

#### 1. *Gather data inputs*

Squadron Service: Navy  
 Number of PAA: 14 aircraft  
 Aircraft Variance: F-35C aircraft  
 F-35C wings spread = 43 feet  
 F-35C wings folded = 31 feet  
 Hangar Ratio: PAA x hangar ratio

#### 2. *Calculate the required hangar width (RHW)*

N = 14 aircraft

Hangar Ratio =  $14/3$   
 = 4.66  
 = 5 (Round up from 4.66)

RHW =  $(1 \times WS) + (N/3 \times WF) + [(N/3 + 1) \times D] + WS$   
 =  $(1 \times 43') + (5 \times 31') + [(5 + 1) \times 7.5'] + 43'$   
 =  $43' + 155' + 45' + 43'$   
 = 286'

#### 3. *Determine the number of standard modules required*

Partial modules = RHW / Standard Module Width  
 =  $286'/212'$   
 = 1.34  
 = 2 (Round up from 1.34)

Number of standard modules required = 2.0

#### 4. *Calculate the GSF required*

GSF =  $2 \times 212' \times 95' \times 1.12$   
 = 45,114 SF

21105/06/07-2.2. **Category Code 211 06 – 01 Space.**

- (1) One Type I standard hangar module 01 space will be planned for each standard size squadron with ten to eighteen carrier aircraft.
- (2) One half Type I standard hangar module 01 space will be planned for each standard size squadron with four to six carrier aircraft.
  - (a) Provide a minimum of 520.5 m<sup>2</sup> (5,600 SF) per squadron when two squadrons share the same Type I standard hangar module.
- (3) One Type II standard hangar module 01 space will be planned for each standard size MV-22 squadron with ten to sixteen aircraft
- (4) One Type III standard hangar module 01 space will be planned for each standard size squadron with six to twelve land based patrol aircraft.
- (5) As with the aircraft, the personnel of all the other (non-standard) squadrons or units that operate aircraft, except Fleet Readiness Squadrons (FRS) and other training squadrons, will be combined. The authorized 01 space will be computed at the rate of 3 m<sup>2</sup> (32.5 SF) per person for this combined total complement. Movable partitions within the 01 space will facilitate prorating of area for non-standard size squadrons and units.
- (6) Squadrons operating with detachments, such as the HSL squadrons, are authorized an additional 19 m<sup>2</sup> (200 SF) of 01 space per detachment based on the average number of detachments on board.
- (7) Squadrons with a cargo/passenger transport mission are authorized additional 01 space for the storage of aircraft equipment as follows:
  - Helicopters and carrier aircraft – 2 m<sup>2</sup> (25 SF) per aircraft.
  - Multi-engine land based aircraft – 5 m<sup>2</sup> (50 SF) per aircraft.
- (8) Since line operations and line maintenance functions must be performed as close as possible to the apron parked aircraft of a squadron, an additional 27.9 m<sup>2</sup> (300 SF) is authorized per squadron. Note, if line operations and line maintenance is currently provided in separate

structures, use Category Code 141 30 Aircraft Line Operations Building and Category Code 211 15 Line Maintenance Shelter for inventory purposes only.

(9) The authorized 01 space for FRS and other training squadrons will be computed at the rate of 3 m<sup>2</sup> (32.5 SF) per permanent billet, less the training department. An additional 12 m<sup>2</sup> (125 SF) per student based on the average on board student load is authorized under Applied Instruction Building (Category Code 171 20) (Flight Training and Briefing Building). The training department billets are deleted from the squadron's complement for requirements calculations as space for these billets is included in the student allowance of 12 m<sup>2</sup> (125 SF). In many squadrons, it may be desirable to locate all, or a portion of the student space allowance in a separate facility or to combine it with the Operational Trainer Facility (Category Code 171 35) (Flight Simulator).

(10) The width of the 01 spaces shall not exceed the width of the computed number of OH modules; however, should the computed 01 space requirement exceed the 01 space available in the computed number of OH modules by twenty percent, authorization for deviations from standard hangar dimensions (see paragraph 1. Design Considerations) may be requested from Commander, Naval Air Systems Command (AIR-8.0Y1).

Maintenance shops compose the majority of the 01 space. Planning factors for 01 space for F-35 aircraft are shown on Tables 21105-4 and 21105-5. Space within the maintenance shops is allocated by the work center planning factor (presented in square feet per work center) and the number of people in each work center. The number of work centers planned per maintenance shop is determined by multiplying the PAA by the hangar ratio (from Table 21105-2). The planning factor for each work center usually accommodates 2-4 maintenance personnel and includes space (based on function) for a computer monitor, work tables/benches, short-term material/tool storage, and internal circulation. For example, the airframes maintenance shop has a recommended planning factor of 350 square feet (SF) per work center. If 10 aircraft are assigned to an F-35C squadron with a 1/3 hangar ratio, three work centers are required to accommodate 6-12 people; therefore, the net area for work centers in the airframe shop is 1,050 SF. In order to account for the variability in shop work schedules and personnel working between the shop and the OH space, use conventional rounding based on the 1/3 hangar ratio for maintenance shop work centers.

**Table 21105-5**  
**01 Space Calculations for F-35C and F-35B**

CATEGORY	Unit	Unit Metric	Unit Factor	Each		Planning Metrics	Space Req't (SF)		
				F-35C	F-35B		F-35C	F-35B	
<b>SHOPS</b>									
Airframes	Work Centers <sup>1</sup>	0.33	per PAA	3	5	350	SF per Work Center	1,050	1,750
Avionics / Electricians (AT/AE)	Work Centers	0.33	per PAA	3	5	150		450	750
Avionics Vault	Storage Area	0.12	% of Avionics	1.0	1.0	20	% of Avionics room	90	150
Aviation Ordnance (AO)	Work Centers	0.33	per PAA	3	5	200	SF per Work center	600	1,000
Life Support (PR) <sup>2</sup>	Lockers	1.00	per Aircrew	18	24	45	SF per Aircrew	810	1,080
Line Operations	Work Centers	0.33	per PAA	3	5	200	SF per Work Center	600	1,000
Low Observability (LO) Maintenance	Work Centers	0.33	per PAA	3	5	150		450	750
Power Plant	Work Centers	0.33	per PAA	3	5	200		600	1,000
Seat & Canopy Maintenance / AME	Work Centers	1	per PAA	1	1	1000		1,000	1,000
Tool Room	Work Centers	0.33	per PAA	3	5	400		1,200	2,000
PMI Work Area	Each	1	per PAA	1	-	1000	SF per Room	1,000	1,000
Training Room	People	0.15	per Primary Shift	17	25	20	SF per Person	340	500
<b>01 Shops Subtotal</b>								<b>8,190</b>	<b>11,980</b>
<b>MAINTENANCE ADMINISTRATION<sup>3</sup></b>									
Ordnance	People	1.00	per Room	1	1	90	SF per Person	90	90
Life Support (PR)	People	1.00	per Room	1	1	90		90	90
Division Office <sup>4</sup>	People	4.00	per Room	4	4	90		360	360
Maintenance Control Area	People	0.05	per Primary Shift	5	8	75		375	600
Maintenance Vault Room	Area	1.00	per Maintenance Control Area	-	-	20	% of Maintenance Control Room	75	120
Maintenance Admin Office	People	1.00	per Primary Shift	-	8	65		-	520
Maintenance Chief	People	1.00	per Room	1	1	90	SF per Person	90	90
Maintenance Officer	People	1.00	per Room	1		90		90	90
Maintenance/Material Control Officer (MCO/MMCO)	People	1	per Room	1	1	90		90	90
Quality Assurance Officer/Assistant	People	1.00	per Room	1	1	90		90	90
Quality Assurance/Quality Control (QA/QC)	People	9.00	per Room	5	8	75		375	600
<b>01 Administration Subtotal</b>								<b>1,725</b>	<b>2,740</b>
<b>SUPPORT SPACES</b>									
Storage	Room	1.00	per Aircraft	5	6	650	SF Per Aircraft in Hangar Bay	3,250	3,900
Breakroom	People	0.45	per Room	68	99	6	45% of Primary Shift X 6 SF	408	594
Duty/Bunk Room	People	1.00	per Room	1	1	125	SF per Room	125	125
Men's Locker Room <sup>5</sup>	People	0.70	per Room	80	118	4.5	70% of Maint Persons X 4.5 SF	360	531
Women's Locker Room <sup>5</sup>	People	0.30	per Room	34	50	5.5	30% of Maint Persons X 5.5 SF	187	275
<b>01 Support Subtotal</b>								<b>4,330</b>	<b>5,425</b>
<b>NET 01 SPACE</b>								<b>14,245</b>	<b>20,145</b>
<b>GROSS 01 SPACE (Net-to-Gross Factor 1.38)</b>								<b>19,658</b>	<b>27,800</b>

Notes: <sup>1</sup>A single Work Center equates to approximately 2-4 people and planning metric includes space (based on function) for computer desks, work tables/benches, storage, and circulation. <sup>2</sup> Includes flight equipment lockers and applicable work centers. <sup>3</sup> For maintenance administration area calculations, planners can use the 61010 guidance, which provides a maximum allowance of 162.5 GSF per person. <sup>4</sup> Includes Airframes officer, Avionics officer, Powerplant officer, and Line officer. <sup>5</sup> Percentages for planning metrics need adjustment for male-female populations.

21105/06/07-2.3. **Category Code 211-07 – 02 Space.**

- (1) One Type I standard hangar module 02 space will be planned for each standard size squadron with twelve to eighteen carrier aircraft.
- (2) One half Type I standard hangar module 02 space will be planned for each standard size squadron with four to six carrier aircraft.
- (3) One Type II standard hangar module 02 space will be planned for each standard size MV-22 squadron with ten to sixteen aircraft
- (4) One Type II standard hangar module 02 space will be planned for each standard size squadron with six to twelve land based patrol aircraft.
- (5) As with the aircraft, the personnel of all the other (non-standard) squadrons or units that operate aircraft, except FRS and other training squadrons, will be combined. The authorized 02 space will be computed at the rate of 3 m<sup>2</sup> (32.5 SF) per person for this combined total complement. Movable partitions within the 02 space will facilitate prorating of area for non-standard size squadrons and units.
- (6) Squadrons operating with detachments, such as the HSL squadrons, are authorized an additional 19 m<sup>2</sup> (200 SF) of 02 space per detachment based on the average number of detachments on board.
- (7) An additional 8 m<sup>2</sup> (80 SF) per squadron of 02 space is authorized for computer equipment room.
- (8) The authorized 02 space for FRS and other training squadrons will be computed at the rate of 3 m<sup>2</sup> (32.5 SF) per permanent billet, less the training department billets.
- (9) The width of the 02 spaces shall not exceed the width of the computed number of OH modules; however, should the computed 02 space requirement exceed the 02 space available in the computed number of OH modules by twenty percent, authorization for deviations from standard hangar dimensions (see paragraph 1. Design Considerations) may be requested from Commander, Naval Air Systems Command (AIR-8.0Y1).

1. Design Considerations

In planning the authorized 01 and 02 spaces, the standard hangar modules shown in UFC 4-211-01, as updated, should be used whenever possible; however, due to the large diversity in the size of squadrons and other units, it is realized that deviations from the

standard dimensions of 11.2 meters (36.8 feet) by 71.6 meters (235 feet) for Type I or 15.24 meters (50 feet) by 73.15 meters (240 feet) for Type II may be necessary.

2. Example

a. Background. A station supports 6 fleet operational F/A-18 squadrons. Each squadron has 12 aircraft and an average of 225 officers and enlisted. On average, one third of these squadrons are on extended deployment. In addition, the station supports an F/A-18A FRS operating 32 aircraft with an allowance of 600 officers and enlisted of which thirty-five are assigned to the training department. The squadron convenes 12 classes per year with 13 replacement pilots per class for a 24-week syllabus. Determine the number and type of maintenance hangars required to support these squadrons.

(1) The 6 fleet operational squadrons fit the criteria for standard size carrier type squadrons (12 to 18 carrier aircraft and 150 to 400 personnel); therefore, they each require one Type I hangar module. However, since one third of the squadrons normally are deployed, the station needs only 4 Type I modules to support the 6 squadrons.

(2) The FRS does not fit the criteria for any standard size squadron; therefore, its hangar requirements are determined using the criteria for non-standard squadrons.

Step 1. Determine RHW of O/H space. The F/A-18 is a carrier aircraft and requires one hangar space for every three aircraft. Total requirement is computed using the formula:

$$RHW = (N/3) \times (W) + ((N/3) - 1) \times (D) + 2 \times SC$$

$$RHW = (32/3) \times (8.38) + ((32/3) - 1) \times (1.52) + 2 \times (7.5)$$

$$RHW = (32/3) \times (27.5) + ((32/3) - 1) \times (5) + 2 \times (2.3)$$

$$RHW = 108.65 \text{ meters or two Type I modules (128.90 meters)}$$

$$RHW = 356.47 \text{ feet or two Type I modules (424 feet)}$$

Step 2. Determine required O1 space.

Personnel Allowance	600
Less Training Department Personnel	<u>35</u>

Total: 565

Space required for squadron personnel =  $(565) \times (3) = 1,695 \text{ m}^2$   
(18,363 SF)

Space required for line maintenance =  $27.9 \text{ m}^2$  (300 SF)

Space for Mechanical/Electrical (AFFF) =  $143 \text{ m}^2$  (1,536 SF)

Total 01 Space =  $1,865.9 \text{ m}^2$  (20,199 SF)

Step 3. Determine required 02 space.

Personnel Allowance	600
Less Training Department Personnel	<u>35</u>
	565

Space required for squadron personnel =  $(565) \times (3) = 1,695 \text{ m}^2$   
(18,363 SF)

Space for Computer Equipment =  $8 \text{ m}^2$  (80 SF)

Total 02 Space =  $1,703 \text{ m}^2$  (18,443 SF)

Step 4. Determine required student support space.

Average student load =

$\frac{((24 \text{ days}) \times (5 \text{ days/week}) \times (13 \text{ students}) \times (12 \text{ classes}))}{(250 \text{ classroom days})} = 75$

Total Training Area =  $75 \text{ Students} \times 12 \text{ m}^2 = 900 \text{ m}^2$  (9,375 SF)

Note: Training Area can be located in the aircraft hangar, in a separate facility, or combined with the Operational Trainer Facility (Category Code 171 35) (Flight Simulator).

(10) Every unit requires dedicated administration and support spaces accessible by all personnel in the unit at the unclassified level. These spaces are generally allocated by square feet per person and are very similar to general administrative spaces found in other areas of a military installation. The administration and support areas are driven by the number of people in the squadron. The administration functions and support areas typically found in 02 space for a JSF squadron are listed in



Table 21105-6. Depending on the PAA, more administration and support functions can be assigned to a squadron, in which case documentation must be provided for the additional space.

**Table 21105-6**  
**02 Space Calculations for F-35C and F-35B**

CATEGORY	Unit	Unit Metric	Unit Factor	Each		Planning Metrics	Space Req't (SF)		
				F-35C	F-35B		F-35C	F-35B	
<b>ADMINISTRATION</b>									
Commanding Officer (CO)	People	1	per Room	1	1	200	SF per Person	200	200
Executive Officer (XO)	People	1	per Room	1	1	200		200	200
Senior Chief	People	1	per Room	1	1	150		150	150
Conference Room	Each	1	per Room	1	1	250	SF per Room	250	250
Reception/Waiting Area	Each	0.05	per Room	1	1	75		75	75
Administration Chief	People	1	per Room	1	1	110	SF per Person	110	110
Admin Personnel	People	6	per Room	4	6	90		360	540
Classified Material Control	People	1	per Room	1	1	110		110	110
Command Career Counselor	People	1	per Room	1	1	110		110	110
Family Readiness	People	1	per Room	1	1	110		110	110
Copy Room	Room	1	per Room	1	1	100		SF per Room	100
Flight Surgeon / Medical	People	2	per Room	2	1	100	SF per Physician (FC 2-000-05N, 61074)	200	100
Operations Administration	People	0.15	per Room	2	7	90	SF per Person	180	630
Operations Officer	People	1	per Room	1	1	110		110	110
Assistant Operations Officer	People	1	per Room	1	1	100		100	100
Scheduling	People	1	per Room	2	2	110		220	220
Intelligence Office	People	1	per Room	1	1	100		100	100
Logistics Staff	People	1	per Room	1	4	90		90	360
Logistics Officer	People	1	per Room	1	1	110		110	110
Safety Staff	People	1	per Room	2	3	90		180	270
Safety Officer	People	1	per Room	1	2	110		110	220
Information Systems	People	1	per Room	2	2	90		180	180
<b>02 Administration Sub-total</b>								<b>3,355</b>	<b>4,355</b>
<b>OPERATIONS AND TRAINING</b>									
Secured Operations Spaces 1	Work-spaces	20	per PAA	1	1	75	SF per workspace (flexible)	1,500	1,500
Secured Operations Spaces 2	Work-spaces	15	per PAA	1	1	100		1,500	1,500
Large Briefing Room(s)	People	1	per Room	2	3	300	SF per Room	600	900
Security Office	People	1	per Room	1	6	110	SF per Person	110	660
Secured Ready Room	People	1	per Pilot	18	24	35	SF per Person	630	840
Small Pilot Planning Rooms	Pilots	0.5	per Pilot	18	24	100	SF per Room	900	1,200
Server Room	Room	1	per PAA	1	1	750	SF per Squadron	750	750
Unisex Restroom	Each	1	per Room	1	1	75	SF per Restroom	75	75
<b>02 Operations and Training Sub-total</b>								<b>6,065</b>	<b>7,425</b>
<b>SUPPORT SPACES</b>									
First Lieutenant	People	0.10	per Room	1	-	90	SF per Room	90	-
Men's Locker Room <sup>1</sup>	People	0.70	per Room	25	37	4.5	70% of Off & Prof Persons X 4.5 SF	113	167
Breakroom	People	0.45	per Room	16	24	6	45% of Off & Prof Persons X 6 SF	96	144
Storage	Admin/Ops	0.03	per Room	1	1	3.0	% of Administration and Operations	283	353
Women's Locker Room <sup>1</sup>	People	0.30	per Room	11	16	5.5	30% of Off & Prof Persons X 5.5 SF	61	88
<b>02 Support Sub-total</b>								<b>642</b>	<b>752</b>
<b>NET 02 SPACE</b>								<b>10,062</b>	<b>12,532</b>
<b>GROSS 02 SPACE (Net-to-Gross Factor 1.31)</b>								<b>13,181</b>	<b>16,417</b>

Note: <sup>1</sup>Percentages for planning metrics need adjustment for male-female populations.

**21105/06/07-2.4. Type IV Unmanned Aircraft System Requirements.**

The requirements of Unmanned Aircraft System (UAS) aircraft are unique and complex encompassing sensitive platform and functional space features. The current UAS aircraft is the MQ-4C Triton. The home basing plan for the Triton is four aircraft to a hangar.

**OH Space**

The Triton aircraft has a wing span of 131 feet. The aircraft body, excluding the wings is five feet wide. The length of the aircraft is five feet. The length of the aircraft is 48 feet. All UAS aircraft must be kept in a hangar due to the sensitive components of the aircraft. The position of the aircraft is in two rows of two in the hangar bay. Two aircraft will be side by side and face the hangar door, and the other two aircraft will be in a position at the rear of the two rows of aircraft that face the hangar door.

**Clearance Standards**

The wingtip clearance between the aircraft is 30 feet. The clearance from the sides of the aircraft to the innermost protrusion from the hangar wall is 15 feet. The distance from the nose of the aircraft to the innermost protrusion of the hangar door is also 15 feet. The distance from the nose of the aircraft of the second row of aircraft to the tail of the first row of aircraft is 15 feet. The distance from the tail of the second aircraft to the innermost protrusion from the rear wall (usually power converters) is 15 feet.

**01 and 02 Space**

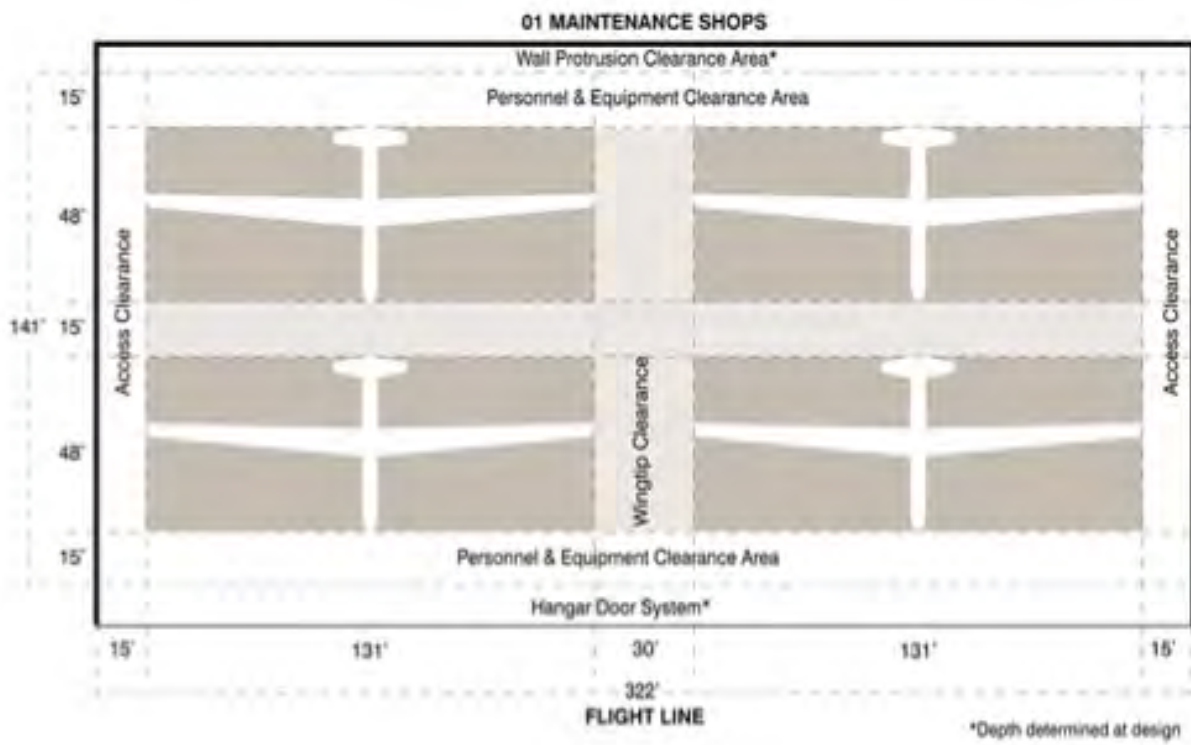
The planning factors for the 01 and 02 space requirements for a Triton hangar are shown in Table 7 and Table 8. The 01 and 02 space figures may differ due to the variation of rotational maintenance detachments for each installation location. The installation must contact CNAL/CNAP N2/N6 to obtain the most detailed information on the maintenance concept and personnel figures for a particular installation.

**Table 211-05-2a  
OH Space Navy Standard  
MQ-4C Triton Model  
Statistics Planning Purposes**

CATEGORY	SPACE REQ'T		PLANNING METRICS	
Required Aircraft Parking Positions	4			
TOTAL WIDTH	322	LF		
Aircraft Width (131' X 2)	262	LF	131	Two adjacent aircraft
Total Wingtip Clearance	30	LF	30	Clearance between Aircraft
Access Clearance (2 X 15')	30	LF	15	Clearance from Side Wall (Unusable)
TOTAL DEPTH	141	LF		
Aircraft Length (48' X 2)	96	LF	48	Two aircraft nose to tail
Clearance to Hangar Door	15	LF	15	Innermost protrusion of hangar door
Nose to Tail Aircraft Clearance	15	LF	15	Clearance between column of two aircraft
Clearance of Aircraft to Rear Wall	15	LF	15	Back Wall Clearance (unusable)
NET OH SPACE	45,402	SFs		
GROSS AREA	50,850	SF	1.12	OH SPACE Net-to-Gross (NTG)

**Key:**  Variable, depends on PAA and squadron  Standard PAA and squadron  Calculation

FIGURE 3. OH Space Diagram – MQ-4



C Triton

**Table 21105-7  
01 Space Calculations for MQ-4C Triton**

CATEGORY	No. Work Centers	SF per Work Center	Space Req't (SF)
<b>SHOPS</b>			
Maintenance Control - Chief	9	100	900
Maintenance Control – Enlisted	8	60	480
Material Control – Officer	2	100	200
Material Control - Enlisted	9	60	540
Tool Room	3	400	1,200
Power Plants Shop (Aviation Mechanic Techs (AD))	3	175	525
Aviation Structural Mechanics (AM)	3	175	525
Aviation Electronics Techs (AT)	3	200	600
Aviation Electricians (AE)	3	200	600
Mission Control Systems Techs (MCS)	3	200	600
Plane Captains (PC) (Line Shack)	3	100	300
Shops Sub-total			6,470
<b>SUPPORT</b>			
Storage (transit case, secure, consumables)	1	1,300	1,300
Break Room	50	6	300
Male Locker Room	183	5	915
Female Locker Room	36	5	180
Printer Area	1	200	200
Security / Duty Office	1	120	120
Support Sub-total			3,015
Net 02 Space			9,485
Gross 01 Space (Net-to-Gross Ratio 1.38)			13,089

Table 21105-8  
02 Space Calculations for MQ-4C Triton

CATEGORY	No. Work Centers	SF per Work Center	Space Req't (SF)
<b>ADMINISTRATION, OPERATIONS, AND TRAINING</b>			
Maintenance Officer	1	120	120
Maintenance Admin & Training - Chief	1	90	90
Maintenance Admin & Training - Enlisted	2	90	180
Quality Assurance & Safety - Officer	1	120	120
Quality Assurance & Safety - Chief	1	90	90
Quality Assurance & Safety - Enlisted	9	90	810
Administration - Chief	1	90	90
Administration - Enlisted	2	90	180
Personnel	3	90	270
1st Lieutenant	4	90	360
Operations	8	90	720
Pilots	4	90	360
Administration, Operations, and Training Sub-Total			3,390
<b>SUPPORT</b>			
Printer Area	1	200	200
SIPR Room	2	100	200
Break Room	40	6	240
Training Space	45	25	1,125
Training Storage	1	200	200
Secure Conference	10	40	400
Forward Operating Base Mission Control System	1	1,400	1,400
Visiting CO and CMC	2	120	240
Support Sub-Total			4,005
Net 01 Space			7,395
Gross 01 Space (Net-to-Gross Ratio 1.31)			9,687

211 08 AIRFRAMES SHOP (NON-NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2112**

**BFR Required: Y**

**Design Criteria:** Military Handbook (MIL-HDBK) 1028/1C, Aircraft Maintenance Facilities

21108-1 **GENERAL.** An Airframes Division at the intermediate maintenance level is required at Navy and Marine Corps Air installations for the testing, maintenance and repair of airframes components. This section provides the method for determining the space requirements for this division.

The primary function of the airframes shop is to repair aircraft structural and hydraulic. It contains a Structures Branch, a Hydraulics/Pneumatics Branch, a Non-Destructive Inspection (NDI) Branch; and, if authorized by NAVAIRSYSCOM, an Electro-Plating/Anodizing Branch. The shop structure is shown in Table 21108-1. In addition to the specific shop structure shown, support space for material storage, administration, training, male and female locker and restrooms, and a mechanical equipment room.

In addition to the specific shop structure shown in Table 21108-1, other areas required within the Airframes Shop include support and training spaces. Typical support spaces would include personnel support (heads, locker rooms, cleaning gear storage, lounge, etc.), parts storage (parts awaiting maintenance (AWM), material awaiting parts (AWP), test equipment, tools not in use, storage for stock of sheet metal, tubing, hose, composite materials, consumable items, Pre-Expended Bin items, Hazardous Material, Hazardous Waste, and associated items), and specialized mechanical equipment spaces (HVAC, specialized environment control for paint shop to control temperature and humidity, specialized environment control for hydraulics shop for establishment of clean room environment, compressed air to most power tools, paint guns, and breathing apparatus). Typical training spaces may include a classroom.



**Table 21108-1  
Airframes Shop Structure**

<b>Branch Code</b>	<b>Shop Code</b>	<b>Function</b>	<b>Definition</b>
<b>500</b>		<b>Airframes Division</b>	<b>Division supervision</b>
<b>510</b>		<b>Structures Division</b>	<b>Structures branch supervision</b>
	51A	Structures Shop	Repair and manufacture of structural components
	51B	Paint Shop	Paint and corrosion control
	51C	Welding Shop	Welding
	51D	Machine Shop	Machining of tools and manufacturing of parts
	51E	Tire/Wheel Shop	Tire replacement and wheel repair
	51F	Composites Shop	Repair of composite structural components
<b>520</b>		<b>Hydraulics/Pneumatics Branch</b>	<b>Hydraulics/Pneumatics branch supervision</b>
	52A	Hydraulics Shop	Repair and manufacture of hydraulics components
	52B	Brake Shop	Repair of brakes and components
	52C	Strut Shop	Repair of struts
<b>530</b>		<b>Non-Destructive Inspection (NDI) Branch</b>	<b>NDI branch supervision</b>
	53A	Radiography Shop	X-Ray inspection
	53B	Electrical/Chemical Shop	Electrical/Chemical inspection
<b>540</b>		<b>Electroplating/Anodizing Branch (if authorized)</b>	<b>Electroplating/Anodizing of components</b>

To determine the square-meter (square-footage) requirements for a given installation, the number of aircraft of all types receiving maintenance support at that installation is totaled. This number is derived by determining the number of aircraft of all types assigned to the installation and subtracting out the number of aircraft normally deployed on ships or detached to another location. The sum is used to enter Column 1 of Table 21108-2, and the required basic area for the Airframes Shop is read in Columns 2 and 3. Table 21108-3 is then entered in order to determine if additional space is required. This area is added to the basic area from Table 21108-2 to provide the required Gross Area for the Airframes Shop. See the following example for a sample computation.

**Table 21108-2  
Basic Space Allowance for Airframes Shops**

<b>Column 1 Total Aircraft</b>	<b>Column 2 Basic Area (Square Meters)</b>	<b>Column 3 Basic Area (Square Feet)</b>
Up to 75	1,283	13,800
76-100	1,422	15,300

Column 1 Total Aircraft	Column 2 Basic Area (Square Meters)	Column 3 Basic Area (Square Feet)
101-125	1,571	16,900
126-150	1,710	18,400
151-175	1,850	19,900
176-200	1,989	21,400
201-225	2,119	22,800
226-250	2,259	24,300
251+	2,398	25,800

Note: An area of 1,283 m<sup>2</sup> (13,800 SF) is the smallest practical space for an Airframes Division with full capabilities. Some small IMAs may not be tasked to provide all airframes functions. Their space requirements shall be individually justified.

**Table 21108-3**  
**Special Space Allowance for Airframes Shops**

Column 1 Special Requirement	Column 2 Additional Space (Square Meters)	Column 3 Additional Space (Square Feet)
F-14 Support (HCT-12 Equipment)	114	1,225
S-3 Support (Beryllium Brakes Maintenance)	51	550
E-2 Support (Vapor Cycle Maintenance)	57	610
Composite Shop (Note 1)	151	1,630
Electro-Plating/Anodizing Shop (Note 2)	63	680

Note 1: Required in support of AV-8, F/A-18, and SH-60 aircraft.

Note 2: Required only when authorized by COMNAVAIRSYSCOM IAW OPNAVINST 4790.2.

1. Example Computation

<u>Number of Aircraft</u>	<u>Type</u>
44	S-3
96	A-7
<u>80</u>	F/A-18
220	

In accordance with Table 211-08B, a total of 220 aircraft requires a basic area of 2,119 m<sup>2</sup> (22,800 SF). From Table 211-08C it is determined the S-3 support requires an additional 51 m<sup>2</sup> (550 SF) and the Composite Shop required for F/A-18 support adds an additional 151 m<sup>2</sup> (1,630 SF). This gives a gross area as follows:

Basic Area	-	2,119 m <sup>2</sup>	22,800 SF
S-3 Support	-	51 m <sup>2</sup>	550 SF
Composite Shop	-	<u>151 m<sup>2</sup></u>	<u>1,630 SF</u>
Gross Area	-	2,321 m <sup>2</sup>	24,980 SF

211 09 AIRCRAFT BORESIGHT RANGE (NON- NAVAIR DEPOT) (EA)

**FAC: 1791**

**BFR Required: Y**

**Design Criteria:** Military Handbook (MIL-HDBK) 1028/1C, Aircraft Maintenance Facilities

21109-1 **GENERAL.** One aircraft boresight range is required at Navy and Marine Corps air installations that service aircraft equipped with fixed guns or gun pods. One boresight range has the capacity to boresight and fire-in 40 such aircraft each month on a single shift basis. A requirement for more than one boresight range at any station must be individually justified. There are two (2) types of ranges:

1.) Type "A" Semi-Enclosed. The Type "A" range shall be located in proximity to taxiways, but special care must be taken to ensure that no visual obstruction occurs between the control tower and runways and taxiways. Due to noise generation and safety considerations, this facility shall be separated from inhabited structures and the station boundary by a minimum distance of 366 meters (1,200 feet).

2.) Type "B" Open. In addition to the location criteria listed above for a Type "A" range, the Type "B" range requires a danger zone area, 1,555 meters (1,700 yards) wide and 6,401 meters (7,000 yards) long.

Both the Type "A" and Type "B" boresight ranges shall have a length of 50.8 meters (2,000 inches) from the firing point of the aircraft to the target at the firing-in-butt.

Generally, a Type "A" range is used unless there is existing land or restricted water area available for the 6,401 meters (7,000 yard), 60-degree sector danger zone required by a Type "B" range. Prevailing winds shall be considered for orientation and noise abatement; however, where practicable, the boresight range should be oriented north and south to avoid firing toward the sun during early or late hours.

A taxiway, Category Code 112 10 is required for access to this facility. An aircraft parking apron with tie-downs, Category Code 113 20 is required to park and secure the aircraft during gun alignment.

In addition, a standard 12- by 20-foot line shelter is planned with this facility for crew shelter and storage of jacks and tiedown gear. See Category Code 211 15, Line Maintenance Shelter, for criteria.

211 10 AIRCRAFT OVERHAUL AND REPAIR SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21110-1 **GENERAL.** An Aircraft Overhaul and Repair Shop is required for the Airframe Production Shop of the Naval Air Depot (NAVAIR Depot). There are generally two types of aircraft overhaul and repair shops. One supports aircraft overhaul and repair of trainer aircraft, fighter aircraft, and helicopters and one supports aircraft overhaul and repair of cargo, transport, and patrol aircraft.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 11 CORROSION CONTROL – CLEANING SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21111-1 **GENERAL.** A Corrosion Control – Cleaning Shop is required to provide space for aircraft corrosion control and decontamination facilities designed for cleaning, paint stripping, etc., of the complete aircraft for the Airframe Production Shop of the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 12 PAINT AND FINISHING HANGAR (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21112-1 **GENERAL.** A Paint and Finishing Hangar is required for the Airframe Production Shop of the Naval Air Depot (NAVAIR Depot). This facility provides space to repaint an entire aircraft.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 13 AIRCRAFT NON-DESTRUCTIVE TESTING SHOP (NAVAIR DEPOT)  
(m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21113-1 **GENERAL.** An Aircraft Non-Destructive Testing Shop is required to provide space for the non-destructive inspection of airframes for the Airframe Production Shop of the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 14 AIRCRAFT REWORK SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21114-1 **GENERAL.** An Aircraft Rework Shop is required for the Airframe Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Airframe Dedicated Machine Shop
- b. Airframe Dedicated Welding Shop
- c. Airframe Dedicated Plating Shop
- d. Airframe Examination and Evaluation, Pre-Shop Analysis and Examination and Inspection Shop
- e. Maintenance Dock
- f. Quick Engine Change Shop – Facility used for quick engine change and engine build-up including deseal and reseal operations.
- g. Fuel Systems Maintenance Facility

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 15 LINE MAINTENANCE SHELTER (m<sup>2</sup> / SF)

**FAC: 2112**

**BFR Required: Y**

**Design Criteria:** Military Handbook (MIL-HDBK) 1028/1C, Aircraft Maintenance Facilities

21115-1 **GENERAL.** Line maintenance shelters are required in support of aircraft located on aircraft parking aprons and at aircraft boresight ranges (Category Code 211 09). For aircraft located on the aircraft parking apron, they provide shelter for squadron line personnel awaiting aircraft that are readying for launch, returning from flight, or being serviced. For aircraft located at the aircraft boresight range, they provide crew shelter and storage for aircraft jacks and tiedown gear. For newer hangars, this

requirement is included in the Aircraft Maintenance Hangar – 01 Space, Category Code 211 06 and as such included in the hangar. However, if space constraints exist in older hangars, or the aircraft parking apron is not in the immediate vicinity of the squadron hangar a line maintenance shelter will be provided. One (1) line maintenance shelter may be planned for each aircraft maintenance hangar module and one (1) for each aircraft boresight range.

The aircraft line maintenance shelter is 6.1 meters (20 feet) by 3.7 meters (12 feet) and is usually a portable facility that is planned as collateral equipment for the basic facility. Collateral equipment is not categorized as Class II real property and thus cannot be included in the real property inventory (RPI). However, this Category Code is being retained for real property inventory purposes since many of the existing facilities are not portable and accordingly must be reported in the Navy Facility Asset Data Base (NFADB).

For inventory purposes, the following guidance is provided:

a.) Line maintenance shelters directly associated with squadron line personnel awaiting aircraft that are readying for launch, returning from flight, or being serviced use Category Code 211 06, Aircraft Maintenance Hangar – 01 Space.

b.) Line maintenance shelters used at aircraft boresight ranges to provide crew shelter and storage for aircraft jacks and tiedown gear use this Category Code.

211 16 AIRCRAFT INTERMEDIATE MAINTENANCE ACTIVITY MANAGEMENT (NON-NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21116-1 **GENERAL.** Management space provides for the control, monitoring, and administration of the Intermediate Maintenance Activity (IMA). The Aircraft Maintenance Officer and staff are responsible for the administration and supervision of the maintenance effort for the IMA. These responsibilities include production control, material control, financial accounting, training, personnel, administration, quality control, technical publications library, data analysis, and tool control for common and special tools and test equipment. The Naval Aeronautical Engineering Services Unit staff and personnel perform In-Service Engineering Agent (ISEA) functions for aircraft and are often co-located in the same spaces. These functions and the specific requirements of each branch are defined by OPNAVINST 4790.2E (series) and are highlighted in Table 21116-1.

**Table 21116-1  
IMA Management**

<b>Branch Code</b>	<b>Shop Code</b>	<b>Function</b>	<b>Definition</b>
010		Aircraft Maintenance Officer (AMO)	IMA Supervisory
01A		Assistant Aircraft Maintenance Officer (AAMO)	IMA Supervisory and Training
01S		AMO Secretary/Reception	Administration
011		Maintenance/Material Control Officer (MMCO)	Production/Material Control Supervisory
020		Production Control	Control of maintenance effort
030		Maintenance Administration	Administration, training, and personnel management of IMA
040		Quality Assurance	Quality Control
	04A	Technical Publication Library	Receipt, issue and storage of master copies of all publications used in the IMA
	04B	Ground Safety	IMA safety office
	04C	Data Analysis	Data gathering, analysis, and reporting. Also includes space for NALCOMIS master computers.
	04D	Quality Management/Verification	Quality Assurance Representatives office and files
050		Material Control	Receipt, issue, ordering, and technical support for all parts required by IMA
	05A	Material Screening	Receipt of all incoming parts to IMA, screening for reparability, issue to shop for repair, receipt from shop, and issue to Supply Dept.
	05B	Material Procurement/Accounting	Ordering and technical support for parts requested by shops. Financial accounting of all IMA accounts
	05C	Individual Material Requirements Readiness List (IMRL) Manager	Management of IMRL which includes all special tools, test equipment, support equipment, and associated items
	05D	Tool Control Center	Management of common hand tools
070		NAESU	Contractor and government technical instructors

Personnel requirements to meet these functions are not noticeably affected by aircraft loading. One size space will be provided for all IMAs. Provide 917 gross m<sup>2</sup> (9,875 GSF) for IMA management functions.

211 17 REGIONAL AIRCRAFT SERVICE FACILITY (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21117-1 **DEFINITION.** During day-to-day aircraft operations, space often may be required to perform aircraft in-service repair (ISR), integrated maintenance (IMC/IMP), modifications (MOD) and other program work that may concurrently involve depot, intermediate, and organizational level work on aircraft by squadron, IMA, Naval Air Depot (NAVAIR Depot), and/or contractor personnel. When the existing organizational level spaces cannot accommodate the additional workload generated by ISR, IMC/P, and/or MOD and it is desirable to keep aircraft under local control, a separate facility will be required.

The Regional Aircraft Service Facility provides space to perform aircraft in-service repair (ISR), integrated maintenance (IMC/IMP), modifications (MOD) and other program work that may concurrently involve depot, intermediate, and organizational level work on aircraft by squadron, IMA, Naval Air Depot (NAVAIR Depot), and/or contractor personnel. Facility is comprised of High-Bay Maintenance Bays, Shop Area, and Administrative Support Space. Shop and Administrative Support areas will be limited to minimal required supporting current and projected programs.

Criteria for this Category Code are currently under development.

211 20 AIRCRAFT ENGINE OVERHAUL SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21120-1 **GENERAL.** An Engine Overhaul Shop is required to provide space associated with processing jet, turbojet, and reciprocating type aviation engines in terms of overhaul, low time repair, complete repair, and major inspection. The work functions performed within this space include uncanning, disassembly, cleaning, material examination, parts reconditioning, subassembly, final assembly and preservation.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.



211 21 ENGINE MAINTENANCE SHOP (NON-NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2112**

**BFR Required: Y**

21121-1 **GENERAL.** An Engine Maintenance Shop provides space for all work centers within the Power Plants Division of an Intermediate Level Maintenance Activity (IMA). The CNO and the CMC assign aircraft maintenance tasks and responsibilities to activities of Naval operating/Training Forces and Fleet/non-Fleet Marine Forces. The NAVAIRSYSCOM, through the NAVAIRNOTE 4700, assigns maintenance tasks and responsibilities for Gas Turbine Engines. Individual IMAs will only be allocated the space required to perform maintenance on the engines, equipment or components authorized for repair at that activity by higher authority, (i.e., NAVAIR/Type Commanders). The authorized work centers may be obtained by the use of Individual Component Repair List (ICRL) for the given IMA.

The Power Plants or Aircraft Engine Maintenance Shop is required to maintain the aircraft engine and associated components. The primary function is to repair aircraft engines, engine components, propellers, rotors, auxiliary power units (APUs), and auxiliary fuel and refueling stores. It contains a Jet Engine Branch, Reciprocating Engine Branch, Propeller Branch, Rotor Dynamics Branch, Test Cell Branch, Auxiliary Fuel Stores Branch, and Navy Oil Analysis Program Laboratory. The shop structure is shown in Table 21121-1.

**Table 21121-1  
Aircraft Engine Maintenance Shop Structure**

<b>Branch Code</b>	<b>Shop Code</b>	<b>Function</b>	<b>Definition</b>
<b>400</b>		<b>Power Plants Division</b>	<b>Division supervision</b>
<b>410</b>		<b>Jet Engine Division</b>	<b>Jet Engine Branch supervision</b>
	51A	Structures Shop	Repair and manufacture of structural components
	51B	Paint Shop	Paint and corrosion control
	51C	Welding Shop	Welding
	51D	Machine Shop	Machining of tools and manufacturing of parts
	51E	Tire/Wheel Shop	Tire replacement and wheel repair
	51F	Composites Shop	Repair of composite structural components
<b>420</b>		<b>Reciprocating Engine Branch</b>	<b>Repair of reciprocating engines</b>
	52A	Hydraulics Shop	Repair and manufacture of hydraulics components
	52B	Brake Shop	Repair of brakes and components
	52C	Strut Shop	Repair of struts
<b>430</b>		<b>Propeller Branch</b>	<b>Repair of aircraft propellers</b>
	53A	Radiography Shop	X-Ray inspection
	53B	Electrical/Chemical Shop	Electrical/Chemical inspection

<b>Branch Code</b>	<b>Shop Code</b>	<b>Function</b>	<b>Definition</b>
<b>440</b>		<b>Rotor Dynamics Branch</b>	<b>Repair of helicopter rotor and associated components</b>
<b>450</b>		<b>Test Cell Branch</b>	<b>Supervisory, scheduling, and maintenance for Test Cell operation</b>
<b>460</b>		<b>Auxiliary Fuel Stores Branch</b>	
<b>470</b>		<b>Navy Oil Analysis Program Laboratory</b>	
<b>480</b>		<b>Welding Shop</b>	

Table 21121-1 lists the space requirements for the main engine work area (high bay) for first and second degree engine maintenance for supported number of a given type of aircraft. The following data items were taken into consideration to arrive at the listed space requirements:

1. Size of engine
2. Number of engines per aircraft
3. Number, type and size of required maintenance stands
4. Work benches
5. Work center administrative and storage area
6. Fire lane/aisle space
7. Mean flight hours between failures (MFHBF) of engines requiring removal to an IMA.
8. Average turnaround time (TAT) of engine in IMA
9. Flight hours between inspections (FHBI)
10. Elapsed inspection time (EIT)
11. Quick engine change assembly (QECA) elapsed build up time (EBT)
12. Aircraft monthly utilization

Table 21121-2 lists the percentage factor of the sum total from Table 21121-1 to determine the additional space required for division administration, utilities and other support functions such as supply support, welding and cleaning shops. These spaces are normally provided in shop wing and/or mezzanine areas.

Table 21121-3 lists the space requirements of additional work centers required for applicable components within the Power Plants Division, if authorized by higher authority to be supported at a given IMA. These spaces may be housed in the high bay area or in a separate building/location.

Note: Though more than one type of the aircraft supported may have the same basic component, only one work center will be required.

Example: F-18 and AV-8 both have an Auxiliary Power Plant (APU); however, only one APU work center will be required.

Table 21121-4 list the space requirements in the main engine work area (high bay) for situations where an AIMD is assigned repair responsibilities for a predetermined number of given type engines not related to those generated by the aircraft directly supported.

To establish space requirements for the Power Plant Division, add the space required for the given numbers of each type aircraft supported from Table 21121-1 and space computed from Table 21121-4. Add to this the additional percentage of space authorized from Table 21121-2 and the additional authorized space from Table 21121-3.

Note: At most installations there are aircraft assigned in support roles, i.e. helicopters or utility type aircraft. These are not computed in the space requirements as they are normally supported by other designated IMAs or depot level activities.

Example Computation – Power Plants Division Shop Space Allowance using an aircraft mix of 44 A-6, 84 F-18, 62 P-3, 23 H-46 and 40 TF-30 engines.

From Table 21121-1

No. A/C	Type A/C	Area (m <sup>2</sup> )	Area (SF)
44	A-6	648	6,975
84	F-18	1,057	11,375
62	P-3	630	6,775
23	H-46	109	1,175
Subtotal		2,444 m <sup>2</sup>	26,300 SF

From Table 21121-4

No. Eng.	Factor (m <sup>2</sup> )	Factor (SF)	Area (m <sup>2</sup> )	Area (SF)
40	7	76	280	3,040

Total 21121-1 and 21121-4

2,724	m <sup>2</sup>
29,340	SF

From Table 21121-2

$$\begin{array}{rclcl}
 2,724 \text{ m}^2 & \times & 44\% & = & 1,199 \text{ m}^2 \\
 29,340 \text{ SF} & \times & 44\% & = & 12,910 \text{ SF}
 \end{array}$$

Total space requirements from Tables 21121-1 and 21121-4 allow up to 2,724 m<sup>2</sup> (29,340 SF) for the high bay area. Table 21135-2 allows up to 1,199 m<sup>2</sup> (12,910 SF) which is 44% of the high bay area for shop wing/mezzanine space.

Table 21121-1 and 21121-4		2,724 m <sup>2</sup> 29,340 SF
Table 21135-2	(44% of 2,724 m <sup>2</sup> ) (44% of 29,340 SF)	1,199 m <sup>2</sup> 12,910 SF
Subtotal =	3,923 42,210	m <sup>2</sup> SF

3,923 m<sup>2</sup> (42,210 SF) constitutes the primary Power Plants Division. If authorized by higher authority, additional applicable work center space requirements from Table 21121-3 shall be added.

From Table 21121-3

	<u>A-6</u>	<u>F-18</u>	<u>P-3</u>	<u>H-46</u>		
Propeller			X		272 m <sup>2</sup>	2,925 SF
APU		X	X	X	167 m <sup>2</sup>	1,800 SF
Rotor Dynamics				X	314 m <sup>2</sup>	3,375 SF
Aux. Fuel Stores	X	X			<u>314 m<sup>2</sup></u>	<u>3,375 SF</u>
					1,067 m <sup>2</sup>	11,475 SF

Note: Only one work center of each type required.

**Table 21121-1  
Space Allowance for Engine Maintenance Shop**

A-4 J-52			A-6 J-52			A-7 TF-41			F-4 J79		
No. A/C	Area (m <sup>2</sup> )	Area (SF)	No. A/C	Area (m <sup>2</sup> )	Area (SF)	No. A/C	Area (m <sup>2</sup> )	Area (SF)	No. A/C	Area (m <sup>2</sup> )	Area (SF)
1-9	86	925	1-8	137	1,475	1-10	184	1,975	1-8	184	1,975
10-19	137	1,475	9-16	239	2,575	11-21	332	3,575	9-17	332	3,575
20-28	188	2,025	17-24	342	3,675	22-32	481	5,175	17-24	481	5,175
29-38	239	2,575	25-32	444	4,775	33-42	630	6,775	25-32	630	6,775
39-47	290	3,125	33-40	546	5,875	43-53	778	8,375	33-40	778	8,375
48-57	342	3,675	41-48	648	6,975	54-63	927	9,975	41-49	927	9,975
58-66	393	4,225	49-56	751	8,075	64-74	1,076	11,575	50-57	1,076	11,575
67-76	444	4,775	57-64	853	9,175	75-85	1,225	13,175	58-65	1,225	13,175

A-4 J-52			A-6 J-52			A-7 TF-41			F-4 J79		
No. A/C	Area (m <sup>2</sup> )	Area (SF)	No. A/C	Area (m <sup>2</sup> )	Area (SF)	No. A/C	Area (m <sup>2</sup> )	Area (SF)	No. A/C	Area (m <sup>2</sup> )	Area (SF)
77-85	495	5,325	65-72	955	10,275	86-95	1,373	14,775	66-73	1,373	14,775
86-95	546	5,875	73-80	1,057	11,375	96-106	1,522	16,375	74-81	1,522	16,375
96-104	597	6,425	81-88	1,160	12,475	107-116	1,671	17,975	82-89	1,671	17,975
105-114	648	6,975	89-96	1,262	13,575	117-127	1,820	19,575	90-98	1,820	19,575
115-123	699	7,525	97-104	1,364	14,675	128-135	1,968	21,175	99-106	1,968	21,175
124-133	751	8,075	105-112	1,466	15,775	136-148	2,117	22,775	107-114	2,117	22,775
134-142	802	8,625	113-120	1,568	16,875	149-150	2,191	23,575	115-122	2,266	24,375
143-150	853	9,175	121-128	1,671	17,975				123-130	2,414	25,975
			129-136	1,773	19,075				131-138	2,563	27,575
			137-145	1,875	20,175				139-150	2,712	29,175
			146-150	1,926	20,725						

**Table 21121-1 (Continued)**  
**Space Allowance for Engine Maintenance Shop**

F-14 TF-30			F-18 F404			H-1 T400			H-2 T58		
No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)
1-8	184	1,975	1-8	137	1,475	1-16	72	775	1-6	109	1,175
9-17	332	3,575	9-17	239	2,575	17-33	109	1,175	7-12	184	1,975
18-26	481	5,175	18-25	342	3,675	34-49	146	1,575	13-19	258	2,775
27-35	630	6,775	26-34	444	4,775	50-66	184	1,975	20-25	332	3,575
36-44	778	8,375	35-43	546	5,875	67-83	221	2,375	26-32	407	4,375
45-53	927	9,975	44-51	648	6,975	84-99	258	2,775	33-38	481	5,175
54-62	1,076	11,575	52-60	751	8,075	100-116	295	3,175	39-45	555	5,975
63-71	1,225	13,175	61-69	853	9,175	117-133	332	3,575	46-51	630	6,775
72-79	1,373	14,775	70-77	955	10,275	134-150	369	3,975	52-57	704	7,575
80-88	1,522	16,375	78-86	1,057	11,375				58-64	778	8,375
89-97	1,671	17,975	87-94	1,160	12,475				65-70	853	9,175
98-106	1,820	19,575	95-103	1,262	13,575				71-77	927	9,975
107-115	1,968	21,175	104-112	1,364	14,675				78-83	1,002	10,775
116-124	2,117	22,775	113-121	1,466	15,775				84-90	1,076	11,575
125-133	2,266	24,375	122-129	1,569	16,875				91-96	1,150	12,375
134-142	2,414	25,975	130-138	1,671	17,975				97-102	1,225	13,175
143-150	2,563	27,575	139-147	1,773	19,075				103-115	1,373	14,775
			148-150	1,829	19,675				116-128	1,522	16,375
									129-141	1,671	17,975
									142-150	1,782	19,175

**Table 21121-1 (Continued)**  
**Space Allowance for Engine Maintenance Shop**

H-3 T58			H-46 T58			H-53 T64			H-60 T700		
No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)
1-8	109	1,175	1-21	72	775	1-6	86	925	1-9	72	775
H-3 T58			H-46 T58			H-53 T64			H-60 T700		
No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)
9-16	184	1,975	22-42	109	1,175	7-12	137	1,475	10-18	109	1,175
17-24	258	2,775	43-64	146	1,575	13-18	188	2,025	19-28	146	1,575
25-32	332	3,575	65-85	184	1,975	19-24	239	2,575	29-37	184	1,975
33-41	407	4,375	86-107	221	2,375	25-30	290	3,125	38-47	221	2,375
42-49	481	5,175	108-128	258	2,775	31-36	342	3,675	48-56	258	2,775
50-57	555	5,975	129-150	295	3,175	37-42	393	4,225	57-65	295	3,175
58-65	630	6,775				43-48	444	4,775	66-75	332	3,575
66-74	704	7,575				49-54	495	5,325	76-84	369	3,975
75-82	778	8,375				55-60	546	5,875	85-94	407	4,375
83-90	853	9,175				61-66	597	6,425	95-103	444	4,775
91-98	927	9,975				67-72	648	6,975	104-113	481	5,175
99-106	1,002	10,775				73-78	699	7,5	114-122	518	5,575
107-115	1,076	11,575				79-85	751	8,075	123-131	555	5,975
116-123	1,150	12,375				86-91	802	8,625	132-141	593	6,375
124-131	1,225	13,175				92-103	904	9,725	142-150	630	6,775
132-139	1,299	13,975				104-115	1,006	10,825			
140-148	1,373	14,775				116-127	1,108	11,925			
149-150	1,411	15,175				128-139	1,211	13,025			
						140-150	1,313	14,125			

**Table 21121-1 (Continued)**  
**Space Allowance for Engine Maintenance Shop**

C-2 T56			C-130 T56			P-3 T56			S-3 TF34		
No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)	No.A/C	Area (m <sup>2</sup> )	Area (SF)
1-19	109	1,175	1-10	184	1,975	1-8	109	1,175	1-6	86	925
20-39	184	1,975	11-20	332	3,575	9-16	184	1,975	7-13	137	1,475
40-58	258	2,775	21-30	481	5,175	17-24	211	2,275	14-19	188	2,025
59-78	332	3,575	31-41	630	6,775	25-32	332	3,575	20-26	239	2,575
79-97	407	4,375	42-51	778	8,375	33-40	407	4,375	27-32	290	3,125
98-117	481	5,175	52-61	927	9,975	41-48	481	5,175	33-39	342	3,675
118-136	555	5,975	62-71	1,076	11,575	49-57	555	5,975	40-45	393	4,225
137-150	630	6,775	72-82	1,225	13,175	58-65	630	6,775	46-52	444	4,775
			83-92	1,373	14,775	66-73	704	7,575	53-59	495	5,325
			93-102	1,522	16,375	74-81	778	8,375	60-65	546	5,875
			103-112	1,671	17,975	82-89	853	9,175	66-72	597	6,425
			113-123	1,820	19,575	90-97	927	9,975	73-78	648	6,975
			124-133	1,968	21,175	98-106	1,002	10,775	79-85	699	7,525
			134-143	2,117	22,775	107-114	1,076	11,575	86-91	751	8,075
			144-150	2,266	24,375	115-122	1,150	12,375	92-98	802	8,625
						123-130	1,225	13,175	99-105	853	9,175
						131-138	1,299	13,975	106-111	904	9,725
						139-146	1,373	14,775	112-124	1,006	10,825
						147-150	1,448	15,575	125-137	1,108	11,925
									138-142	1,211	13,025
									143-150	1,313	14,125

**Table 21121-1 (Continued)**  
**Space Allowance for Engine Maintenance Shop**

AV-8 F402			OV-10 T76			TA-4 J52			TH-1 T53		
No.A/C	Area (sq.m)	Area (SF)	No.A/C	Area (sq.m)	Area (SF)	No.A/C	Area (sq.m)	Area (SF)	No.A/C	Area (sq.m)	Area (SF)
1-11	258	2,775	1-8	72	775	1-7	86	925	1-26	72	775
12-22	481	5,175	9-16	109	1,175	8-15	137	1,475	27-53	109	1,175
23-33	704	7,575	17-24	146	1,575	16-23	188	2,025	54-80	146	1,575
34-45	927	9,975	25-32	184	1,975	24-30	239	2,575	81-107	184	1,975
46-56	1150	12,375	33-40	221	2,375	31-38	290	3,125	108-134	221	2,375
57-67	1373	14,775	41-49	258	2,775	39-46	342	3,675	135-150	258	2,775
68-78	1596	17,175	50-57	295	3,175	47-54	393	4,225			
79-90	1820	19,575	58-65	332	3,575	55-61	444	4,775			
91-101	2043	21,975	66-73	369	3,975	62-69	495	5,325			
102-112	2266	24,375	74-81	407	4,375	70-77	546	5,875			
113-123	2489	26,775	82-90	444	4,775	78-84	597	6,425			
124-135	2712	29,175	91-98	481	5,175	85-92	648	6,975			
136-146	2935	31,575	99-106	518	5,575	93-100	699	7,525			
147-150	3158	33,975	107-114	555	5,975	101-108	751	8,075			
			115-122	593	6,375	109-115	802	8,625			
			123-130	630	6,775	116-123	853	9,175			
			131-139	667	7,175	124-131	904	9,725			
			140-147	704	7,575	132-138	955	10,275			
			148-150	741	7,975	139-146	1006	10,825			
						147-150	1057	11,375			



**Table 21121-1 (Continued)**  
**Space Allowance for Engine Maintenance Shop**

TH-57 T63			T2C J85			T-34C PT-6			T-39D J60		
No.A/C	Area (sq.m)	Area (SF)	No.A/C	Area (sq.m)	Area (SF)	No.A/C	Area (sq.m)	Area (SF)	No.A/C	Area (sq.m)	Area (SF)
1-15	53	575	1-7	109	1,175	1-6	72	775	1-6	137	1,475
16-30	72	775	8-14	184	1,975	7-13	109	1,175	7-13	239	2,575
31-45	91	975	15-22	258	2,775	14-20	146	1,575	14-20	342	3,675
46-60	109	1,175	23-29	332	3,575	21-27	184	1,975	21-27	444	4,775
61-75	128	1,375	30-37	407	4,375	28-33	221	2,375	28-34	546	5,875
76-90	146	1,575	38-44	481	5,175	34-40	258	2,775	35-41	648	6,975
91-105	165	1,775	45-52	555	5,975	41-47	295	3,175	42-48	751	8,075
106-120	184	1,975	53-59	630	6,775	48-54	332	3,575	49-55	853	9,175
121-135	202	2,175	60-67	704	7,575	55-60	369	3,975	56-62	955	10,275
136-150	221	2,375	68-74	778	8,375	61-67	407	4,375	63-68	1,057	11,375
			75-82	853	9,175	68-74	444	4,775	69-75	1,160	12,475
			83-89	927	9,975	75-81	481	5,175	76-82	1,262	13,575
			90-97	1,002	10,775	82-88	518	5,575	83-89	1,364	14,675
			98-104	1,076	11,575	89-94	555	5,975	90-96	1,466	15,775
			105-111	1,150	12,375	95-101	593	6,375	97-103	1,569	16,875
			112-119	1,225	13,175	102-108	630	6,775	104-110	1,671	17,975
			120-126	1,299	13,975	109-115	667	7,175	111-117	1,773	19,075
			127-134	1,373	14,775	116-121	704	7,575	118-124	1,875	20,175
			135-141	1,448	15,575	122-135	778	8,375	125-137	2,080	22,375
			142-150	1,522	16,375	136-150	853	9,175	138-150	2,284	24,575

**Table 21121-1 (Continued)**  
**Space Allowance for Engine Maintenance Shop**

T-44A PT-6		
No.A/C	Area (sq.m)	Area (SF)
1-8	109	1,175
9-16	184	1,975
17-24	258	2,775
25-33	332	3,575
34-41	407	4,375
42-49	481	5,175
50-57	555	5,975
58-66	630	6,775
67-74	704	7,575
75-83	778	8,375
84-91	853	9,175
92-99	927	9,975
100-108	1,002	10,775
109-116	1,076	11,575
117-124	1,150	12,375
125-132	1,225	13,175
133-141	1,299	13,975
142-150	1,373	14,775

**Table 21121-2  
Additional Space Requirements**

m <sup>2</sup>	SF	Percentage	m <sup>2</sup>	SF	Percentage
Up to 1,394	Up to 15,000	50%	3,021 – 3,253	32,501 – 35,000	42%
1,395 – 1,626	15,001 – 17,500	49%	3,254 – 3,485	35,001 – 37,500	41%
1,627 – 1,859	17,501 – 20,000	48%	3,486 – 3,718	37,501 – 40,000	40%
1,860 – 2,091	20,001 – 22,500	47%	3,719 – 3,950	40,001 – 42,500	39%
2,092 – 2,323	22,501 – 25,000	46%	3,951 – 4,182	42,501 – 45,000	38%
2,324 – 2,556	25,001 – 27,500	45%	4,183 – 4,415	45,001 – 47,500	37%
2,557 – 2,788	27,501 – 30,000	44%	4,416 – 4,647	47,501 – 50,000	36%
2,789 – 3,020	30,001 – 32,500	43%	4,648 and Up	50,001 and Up	35%

**Table 21121-3  
Support Work Centers**

Group	Work Area	Aircraft	Adjustment (m <sup>2</sup> )	Adjustment (SF)
A.	Auxiliary Fuel Stores	A-4, A-6, A-7, F-4, F-14, F-18	314	3,375
B.	Auxiliary Power Units	C-2, C-130, E-2, F-18, H-46, H-53, H-60, P-3, S-3, AV-8	167	1,800
C.	Propellers	C-2, C-130, E-2, P-3, T-34, OV-10	272	2,925
D.	Rotor Dynamics	H-1, H-2, H-3, H-46, H-53, H-60	314	3,375

**Table 21121-4  
Space Allowance for Additional Engines Processed**

Type Engine	Factor (m <sup>2</sup> )	Factor (SF)	Type Engine	Factor (m <sup>2</sup> )	Factor (SF)
J-52	7	77	TF-41	10	112
J-79	12	126	TF-30	7	76
F-404	5	54	T-400	4	48
T-58	4	46	T-64	9	92
T-700	4	44	T-56	6	65
TF-34	5	52	F-402	12	130
T-76	4	43	J-85	5	51
PT-6	4	40	J-60	5	54
T-53	3	30	T-63	2	21

To calculate the required work space, multiply the factor by the number of engines projected to be processed in a 12 month period, add this to the existing work area from Table 211-21A and apply Table 211-21B.

If a new Work Center is established, the minimum area should be 2,000 Sq.Ft.

Pavement is provided for outside storage of engines in sealed containers calculated at 25 percent of the gross building area.

211 22 ENGINE PREPARATION AND STORAGE SHOP (NAVAIR DEPOT)  
(m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21122-1 **GENERAL.** An Engine Preparation and Storage Shop is required provide space used in preparing engines for test, storage or shipment for the Engine Production Shop of the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 23 ENGINE EXAMINATION AND EVALUATION SHOP (NAVAIR DEPOT)  
(m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21123-1 **GENERAL.** An Engine Examination and Evaluation Shop is required for the Engine Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Engine Non-Destructive Testing Shop
- b. Engine Examination and Evaluation, Pre-Shop Analysis, Examination and Inspection Shop

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 24 DEDICATED AIRCRAFT ENGINE OVERHAUL – GENERAL PROCESS  
(NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21124-1 **GENERAL.** A Dedicated Aircraft Engine Overhaul – General Process Shop is required for the Engine Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Engine Dedicated Cleaning Shop
- b. Engine Dedicated Paint Shop
- c. Engine Dedicated Machine Shop
- d. Engine Dedicated Plating Shop

- e. Engine Dedicated Welding Shop
- f. Engine Modification and Repair Shop

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 25 JET ENGINE OVERHAUL SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21125-1 **REQUIREMENT.** A Jet Engine Overhaul Shop is required for the Engine Production Shop of the Naval Air Depot (NAVAIR Depot).

211 26 RECIPROCATING ENGINE OVERHAUL SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21126-1 **REQUIREMENT.** A Reciprocating Engine Overhaul Shop is required for the Engine Production Shop of the Naval Air Depot (NAVAIR Depot).

211 27 TURBINE ENGINE OVERHAUL SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21127-1 **REQUIREMENT.** A Turbine Engine Overhaul Shop is required for the Engine Production Shop of the Naval Air Depot (NAVAIR Depot).

211 30 AIRCRAFT AND ENGINE ACCESSORIES OVERHAUL SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21130-1 **REQUIREMENT.** An Aircraft and Engine Accessories Overhaul Shop is required to provide space for the overhaul and testing of miscellaneous accessories such as control assemblies, engine fuel system components, and accessories gear drive for the Accessories and Components Production Shop of the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 31 DEDICATED AIRCRAFT AND ENGINE ACCESSORIES OVERHAUL – GENERAL PROCESS (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21131-1 **GENERAL.** A Dedicated Aircraft and Engine Accessories Overhaul – General Process Shop is required for the Accessories and Components Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Accessories and Components Dedicated Cleaning Shop
- b. Accessories and Components Dedicated Paint Shop
- c. Accessories and Components Dedicated Machine Shop
- d. Accessories and Components Dedicated Plating Shop
- e. Accessories and Components Dedicated Welding Shop
- f. Examination and Evaluation, Pre-Shop Analysis, examination and Inspection Shop
- g. Hazardous Test Shop – This facility is used to test a portion of the accessories items overhauled. Because of the volatile fluid with which they are tested or the hazardous conditions of testing, the test area must be rigidly controlled. Items such as fuel pumps, fuel controls, etc. are worked in this area.
- h. Reclamation Shop – Facility for removal of useable parts from defective end item components.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 32 METAL COMPONENTS SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21132-1 **GENERAL.** A Metal Components Shop is required for the Accessories and Components Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Tank and Radiator Repair Shop – Facility to repair all types of radiators, inter-coolers and metal tanks.
- b. Sheet Metal Shop – Facility for repair of surface sheet metal parts.
- c. Metal Surface Shop – Facility for repair of wings, doors, stabilizers, tail booms, control surfaces, etc.

- d. Seat Repair Shop.
- e. Metal Bonding Shop.
- f. Container Reclamation Shop – Facility for repair of engine, transmission, rotor blade and other type metal containers.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 33 NON-METAL COMPONENTS SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21133-1 **GENERAL.** A Non-Metal Components Shop is required for the Accessories and Components Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Life Raft Repair Shop – Facility to repair inflatable life vests, dinghies, etc..
- b. Rubber Repair Shop – Facility for the repair of rubber equipment such as aircraft fuel cells and molded rubber products.
- c. Parachute Repair Shop – Facility for repair of parachutes, aerial pickup gear, etc.
- d. Fabric and Upholstery Shop.
- e. Tire Repair Shop.
- f. Plastic and Fiberglass Shop – Facility for the repair of fiberglass and reinforced plastic items such as radomes, wingtips, ducts, covers, canopies, hatches and windows.
- g. Composite Rework Shop.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 34 DYNAMIC COMPONENTS SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21134-1 **GENERAL.** A Dynamic Components Shop is required for the Accessories and Components Production Shop of the Naval Air Depot (NADEP). Included within this Category Code are:

- a. Propeller and Propeller Control Overhaul Shop
- b. Rotor Head Overhaul Shop

- c. Rotor Blade Overhaul Shop
- d. Transmission/Gearbox Overhaul Shop
- e. Dynamic Drive System Overhaul Shop – Facility used for the repair of drive shafts, pitch links, swash plates, etc..

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 35 HYDRAULIC COMPONENTS SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21135-1 **GENERAL.** A Hydraulic Components Shop is required for the Accessories and Components Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- A. Hydraulic Components Overhaul Shop
- B. Bearings Shop - Specialized shop in which bearings are cleaned, disassembled, inspected, reassembled and tested.
- C. Aircraft Landing Gear Shop - Facility used for the repair and overhaul of aircraft landing gear components such as wheels, brakes, and struts.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 36 ELECTRICAL COMPONENTS SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21136-1 **GENERAL.** An Electrical Components Shop is required for the Accessories and Components Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Alternator Drive Overhaul Shop
- b. Electrical Accessories Overhaul and Test Shop – Facility used in the overhaul and test of electrical components including electrical systems, starters, control equipment and converters, etc..
- c. Battery Shop – Facility for the repair and test of aircraft batteries.
- d. Constant Speed Drive Shop
- e. Electro-Mechanical Components Shop – Facility used to repair Electro-Mechanical actuators, cargo and rescue hoists, etc.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 37 TURBINE ACCESSORIES SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21137-1 **GENERAL.** A Turbine Accessories Shop is required for the Accessories and Components Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Turbine Accessories Overhaul Shop – Facility for overhaul of air compressor type equipment, such as air turbine starters, air conditioning packs, and air driven motors.
- b. Turbine Accessories Test Shop
- c. General Purpose Units Shop – Facility for the overhaul and repair of gas/air turbine engines and auxiliary power units, installed on the aircraft other than its' primary propulsion unit.
- d. General Purpose Units Tests Shop
- e. Ram/Air Turbine Accessories Overhaul Shop – Facility used for the overhaul of air driven accessories such as ram air turbines and scoops.
- f. Ram/Air Turbine Accessories Test Shop

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 38 PNEUMATIC OXYGEN SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21138-1 **GENERAL.** A Pneumatic Oxygen Shop is required for the Accessories and Components Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Pneumatic Components Overhaul Shop
- b. Cryogenics Shop
- c. Oxygen Equipment Shop – Facility used for repair of oxygen regulators, converters, etc.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.



211 39 OPTICAL AND PHOTOGRAPHIC COMPONENTS SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

**21138-1 GENERAL.** An Optical and Photographic Components Shop is required for the Accessories and Components Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Photographic Equipment Repair Shop – Facility for the repair of aircraft cameras and other photographic items.
- b. Optical Component Repair Shop

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 40 ELECTRONICS, COMMUNICATION, AND ARMAMENT SYSTEM SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

**21140-1 GENERAL.** An Electronics, Communication, and Armament System Shop is required to provide space associated with processing airborne communication and navigation equipment, instruments, airborne data computers, fire control and bombing system equipment, gyroscopes, inertial guidance systems, and other avionics equipment.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 41 DEDICATED ELECTRONICS, COMMUNICATION, AND ARMAMENT – GENERAL PROCESS SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

**21141-1 GENERAL.** A Dedicated Electronics, Communication, and Armament – General Process Shop is required for the Electronic, Communication, and Armament Systems Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Electronics, Communication, and Armament Systems Dedicated Cleaning Shop
- b. Electronics, Communication, and Armament Systems Dedicated Paint Shop
- c. Electronics, Communication, and Armament Systems Dedicated Machine Shop
- d. Electronics, Communication, and Armament Systems Dedicated Welding Shop
- e. Electronics, Communication, and Armament Systems Dedicated Plating Shop
- f. Electronics, Communication, and Armament Systems Dedicated Plating Shop
- g. Electronics, Communication, and Armament Systems Dedicated Bearings Shop
- h. Instrument Overhaul Shop

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 42      ELECTRONIC SYSTEM COMPONENTS SHOP (NAVAIR DEPOT)  
( m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21142-1      **GENERAL.** An Electronic System Components Shop is required for the Electronic, Communication, and Armament Systems Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Armament and Avionics Shop – Facility for the repair of navigational missile and bombing radar, electronic countermeasure equipment, flight facilities and communication equipment, electronic instruments, and fire control systems.
- b. Airborne Systems Software Shop – Facility for the preparation, repair or modification of software packages for aircraft automated systems.
- c. Navigational Aids Repair Shop – Facility for the repair of airborne navigational instruments such as celestial tracking system, sextants, driftmeters, etc..
- d. Avionics Testing Shop

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 43        INERTIAL QUALITY INSTRUMENT OVERHAUL SHOP (NAVAIR  
DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21143-1        **GENERAL.** An Inertial Quality Instrument Overhaul Shop is required for the Electronic, Communication, and Armament Systems Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Inertial Quality Gyroscope Overhaul Shop – Environmental controlled space for the overhaul of inertial quality gyroscopes. Inertial quality gyroscopes are those having a radome drift rate of 0.25 degrees per hour or less. All other gyroscopes are considered non-inertial quality for facility categorization purposes.
- b. Inertial Guidance System Overhaul and Calibration Shop

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 44        NON-INERTIAL QUALITY INSTRUMENT OVERHAUL SHOP (NAVAIR  
DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21144-1        **GENERAL.** A Non-Inertial Quality Instrument Overhaul Shop is required for the Electronic, Communication, and Armament Systems Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Electronic Instrument Overhaul Shop – Facility used to support communications electronic instruments such as systems and display panels, oscilloscopes, etc..
- b. Mechanical Instrument Overhaul Shop – Facility for the overhaul of items such as bank indicators and air speed indicators.
- c. Non-inertial Gyroscope Overhaul Shop – Facility used to overhaul non-inertial gyroscope devices such as N-1 compass gyroscopes, bomb navigational system gyroscopes, etc.
- d. Magnetic Instrument Overhaul and Test Shop

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 45 AVIONICS SHOP (NON-NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2112**

**BFR Required: Y**

21145-1 **GENERAL.** An Avionics Division at the intermediate maintenance level is required at Navy and Marine Corps Air installations for the testing, maintenance and repair of avionics systems. This section provides the method for determining the space requirements for this division. For additional guidance applicable to Marine Corps installations, see the 211 Supplement – Marine Corps Aircraft Maintenance Facilities. The Avionics Division is made up of standard size work centers, variable size work centers and support spaces.

- a. Standard size work centers are those that do not vary with type/model of aircraft and size is determined by function and/or support equipment; i.e.: 60A Corrosion Control, 61D Crypto Repair, 62D Battery.
- b. Variable size work centers are those that vary in size due to the quantity of support equipment required based on the number of aircraft supported; i.e.: 610 Comm./Nav., 62A Electrical, 64A Radar, 65A SACE, and 65P VAST.
- c. Support spaces consist of those areas not directly involved in actual repair of aircraft components; i.e.: administrative, material control, production control, mechanical equipment room, passageways, locker rooms/heads, and the Precision Measuring Equipment (PME) work centers.

MIL-HDBK-1028/1B contains definitive drawings for various types of Avionics Shops. The selection of the definitive drawing to be used in planning an Avionics Shop is generally a local decision.

The determination of gross square-footage requirements for a given air installation is accomplished through the use of Table 21145-1, Individual Aircraft Basic Allowance, and Table 21145-2, Multiple Aircraft Percentage Factors. This latter Table provides adjustments based on reduced requirements of support equipment due to commonality of aircraft components and to prevent duplicate allocations of standard size work centers and support spaces which are included in each individual aircraft basic space allowance.

Initially Table 21145-1 is entered using the number of assigned aircraft of each type/model. This provides the basic allowance for each type, and except as modified by Table 21145-3, is the total gross area for the support of a single type/model aircraft.

For installations supporting two or more type/model aircraft, the individual aircraft basic allowances from Table 21145-1 for each type/model are listed in descending order. Table 21145-2 is then entered with the first aircraft (largest basic space allowance) as the prime and the second aircraft as the secondary. The corresponding percentage

factor is the percentage of the second aircraft's basic space allowance that will be added to the total space allowance of the first aircraft in computing the total space requirements. The percentage factor for the third (and succeeding) aircraft are determined by entering Table 21145-2 with each aircraft in the secondary column and selecting the smallest percentage factor when considered with all the other type/model aircraft with larger basic space allowances as the prime. These factors are applied to each aircraft's basic space allowance and the results added to compute the total space allowance for the installation.

Tables 21145-1 and 21145-2 are designed for Avionics Divisions of medium to large size Intermediate Maintenance Activities that would normally require separate space for the full range of work centers. In smaller activities several functions are usually combined, reducing overall space requirements. Table 21145-3 provides an adjustment factor that is to be applied when the gross space allowance determined from Tables 21145-1 and 21145-2 is less than 40,000 square feet.

**Table 21145-1  
Individual Aircraft Basic Space Allowance  
(Values in 100 m<sup>2</sup>/100 SF)**

Up to	A-4		TA-4		A-6		EA-6		KA-6		Up to
	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	
<b>4</b>	12.08	130	9.48	102	22.87	246	23.05	248	19.33	208	<b>4</b>
<b>8</b>	12.08	130	9.48	102	23.05	248	23.14	249	19.33	208	<b>8</b>
<b>12</b>	12.08	130	9.48	102	23.42	252	23.24	250	19.33	208	<b>12</b>
<b>16</b>	12.08	130	9.76	105	23.80	256	23.42	252	19.33	208	<b>16</b>
<b>20</b>	12.08	130	9.76	105	24.26	261	23.61	254	19.33	208	<b>20</b>
<b>24</b>	12.08	130	9.95	107	24.45	263	24.07	259	19.43	209	<b>24</b>
<b>28</b>	12.08	130	10.04	108	24.63	265	24.54	264	19.43	209	<b>28</b>
<b>32</b>	12.08	130	10.22	110	24.82	267	24.91	268	19.43	209	<b>32</b>
<b>36</b>	12.08	130	10.32	111	25.28	272	25.19	271	19.43	209	<b>36</b>
<b>40</b>	12.08	130	10.50	113	25.84	278	25.47	274	19.52	210	<b>40</b>
<b>44</b>	12.08	130	10.60	114	26.31	283	25.75	277	19.52	210	<b>44</b>
<b>48</b>	12.08	130	10.78	116	26.86	289	26.03	280	19.52	210	<b>48</b>
<b>52</b>	12.27	132	10.88	117	27.33	294	26.31	283	19.52	210	<b>52</b>
<b>60</b>	12.27	132	11.06	119	28.35	305	26.86	289	19.52	210	<b>60</b>
<b>68</b>	12.36	133	11.43	123	28.63	308	27.51	296	19.71	212	<b>68</b>
<b>76</b>	12.46	134	11.71	126	29.00	312	28.16	303	20.08	216	<b>76</b>
<b>84</b>	12.64	136	12.08	130	29.28	315	28.81	310	20.08	216	<b>84</b>
<b>92</b>	12.73	137	12.46	134	29.65	319	29.56	318	20.26	218	<b>92</b>
<b>100</b>	12.83	138	12.83	138	30.02	323	30.30	326	20.45	220	<b>100</b>
<b>116</b>	12.92	139	13.29	143	30.30	326					<b>116</b>
<b>132</b>	13.01	140	13.76	148	30.67	330					<b>132</b>
<b>148</b>	13.11	141	14.31	154	31.05	334					<b>148</b>
<b>164</b>						340					<b>164</b>
<b>180</b>						347					<b>180</b>
<b>196</b>						354					<b>196</b>

**Table 21145-1 (Continued)**  
**Individual Aircraft Basic Space Allowance**  
**(Values in 100 m<sup>2</sup>/100 SF)**

Up to	A-7		C-2		C-130		E-2		F-4		Up to
	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	
<b>4</b>	27.70	298	16.17	174	11.71	126	20.08	216	13.85	149	<b>4</b>
<b>8</b>	27.70	298	16.17	174	11.71	126	20.64	222	14.13	152	<b>8</b>
<b>12</b>	27.70	298	16.17	174	11.71	126	20.64	222	14.41	155	<b>12</b>
<b>16</b>	27.98	301	16.17	174	11.71	126	21.75	234	14.69	158	<b>16</b>
<b>20</b>	27.98	301	16.17	174	11.71	126	22.40	241	14.97	161	<b>20</b>
<b>24</b>	28.26	304	16.27	175	11.71	126	22.40	241	15.06	162	<b>24</b>
<b>28</b>	28.44	306	16.27	175	11.90	128	22.40	241	15.15	163	<b>28</b>
<b>32</b>	28.63	308	16.27	175	12.08	130	22.40	241	15.24	164	<b>32</b>
<b>36</b>	28.63	308	16.36	176	12.27	132	22.59	243	15.24	164	<b>36</b>
<b>40</b>	28.81	310	16.36	176	12.36	133	22.77	245	15.34	165	<b>40</b>
<b>44</b>	29.09	313	16.45	177	12.46	134	22.87	246	15.34	165	<b>44</b>
<b>48</b>	29.19	314	16.55	178	12.64	136	23.05	248	15.43	166	<b>48</b>
<b>52</b>	29.37	316	16.55	178	12.83	138	23.42	252	15.52	167	<b>52</b>
<b>60</b>	29.84	321	16.73	180	13.01	140	23.70	255	15.62	168	<b>60</b>
<b>68</b>	30.30	326	16.73	180	13.20	142	23.80	256	15.71	169	<b>68</b>
<b>76</b>	30.77	331	16.82	181	13.38	144	23.98	258	15.80	170	<b>76</b>
<b>84</b>	31.23	336	16.92	182	13.66	147	24.07	259	15.89	171	<b>84</b>
<b>92</b>	31.70	341	16.92	182	13.94	150	24.26	261	15.99	172	<b>92</b>
<b>100</b>	32.16	346	17.01	183	14.22	153	24.35	262	16.08	173	<b>100</b>
<b>116</b>	33.46	360									<b>116</b>
<b>132</b>	34.86	375									<b>132</b>
<b>148</b>	36.16	389									<b>148</b>
<b>164</b>	37.55	404									<b>164</b>
<b>180</b>	38.95	419									<b>180</b>
<b>196</b>	40.34	434									<b>196</b>

**Table 21145-1 (Continued)**  
**Individual Aircraft Basic Space Allowance**  
**(Values in 100 m<sup>2</sup>/100 SF)**

Up to	F-14		F/A-18		AH-1T		AH-1W		UH-1		Up to
	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	
4	25.56	275	27.70	298	13.01	140	12.46	134	11.53	124	4
8	26.96	290	27.70	298	13.01	140	12.46	134	11.53	124	8
12	26.96	290	27.70	298	13.01	140	12.46	134	11.53	124	12
16	28.63	308	27.70	298	13.01	140	12.46	134	11.53	124	16
20	30.02	323	27.70	298	13.01	140	12.46	134	11.53	124	20
24	31.14	335	27.89	300	13.01	140	12.46	134	11.53	124	24
28	32.25	347	28.07	302	13.01	140	12.46	134	11.53	124	28
32	33.37	359	28.26	304	13.01	140	12.46	134	11.53	124	32
36	33.65	362	28.44	306	13.01	140	12.46	134	11.53	124	36
40	33.93	365	28.72	309	13.01	140	12.46	134	11.53	124	40
44	34.21	368	28.91	311	13.01	140	12.46	134	11.53	124	44
48	34.48	371	29.09	313	13.01	140	12.46	134	11.53	124	48
52	34.76	374	29.37	316	13.01	140	12.46	134	11.53	124	52
60	35.14	378	29.56	318	13.01	140	12.46	134	11.53	124	60
68	35.60	383	29.93	322	13.01	140	12.55	135	11.53	124	68
76	35.97	387	30.30	326	13.01	140	12.55	135	11.62	125	76
84	36.44	392	30.67	330	13.01	140	12.55	135	11.62	125	84
92	36.90	397	31.05	334	13.01	140	12.64	136	11.62	125	92
100	37.27	401	31.42	338	13.01	140	12.64	136	11.62	125	100
116	38.57	415	31.42	338	13.01	140					116
132	39.04	420	32.07	345	13.01	140					132
148	39.50	425	32.72	352	13.01	140					148
164	39.97	430	33.37	359	13.01	140					164
180	40.43	435	34.02	366	13.01	140					180
196	40.81	439	34.67	373	13.01	140					196

**Table 21145-1 (Continued)**  
**Individual Aircraft Basic Space Allowance**  
**(Values in 100 m<sup>2</sup>/100 SF)**

Up to	SH-2		SH-3		CH-46		CH-53		RH-53		Up to
	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	
4	11.53	124	13.11	141	12.73	137	10.13	109	21.01	226	4
8	11.53	124	13.11	141	12.73	137	10.13	109	21.19	228	8
12	11.53	124	13.11	141	12.73	137	10.13	109	21.29	229	12
16	11.53	124	13.11	141	12.73	137	10.13	109	21.47	231	16
20	11.53	124	13.11	141	12.73	137	10.13	109	21.56	232	20
24	11.53	124	13.11	141	12.73	137	10.13	109	21.75	234	24
28	11.62	125	13.11	141	12.73	137	10.13	109	21.94	236	28
32	11.62	125	13.11	141	12.73	137	10.13	109	22.12	238	32
36	11.71	126	13.11	141	12.83	138	10.22	110	22.31	240	36
40	11.71	126	13.20	142	12.83	138	10.22	110	22.59	243	40
44	11.71	126	13.20	142	12.83	138	10.32	111	22.96	247	44
48	11.80	127	13.20	142	12.83	138	10.41	112	23.33	251	48
52	11.80	127	13.20	142	12.83	138	10.41	112	23.52	253	52

Up to	SH-2		SH-3		CH-46		CH-53		RH-53		Up to
	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	
60	11.80	127	13.20	142	12.83	138	10.50	113	23.89	257	60
68	11.90	128	13.29	143	12.92	139	10.69	115	24.26	261	68
76	11.99	129	13.29	143	12.92	139	10.88	117	24.63	265	76
84	11.99	129	13.29	143	12.92	139	11.06	119	25.00	269	84
92	12.08	130	13.38	144	13.01	140	11.25	121	25.47	274	92
100	12.18	131	13.38	144	13.01	140	11.43	123	25.84	278	100
116											116
132											132
148											148
164											164
180											180
196											196

**Table 21145-1 (Continued)**  
**Individual Aircraft Basic Space Allowance**  
**(Values in 100 m<sup>2</sup>/100 SF)**

Up to	SH-60		P-3		S-3		AV-8		OV-10		Up to
	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	m <sup>2</sup>	SF	
4	16.55	178	23.42	252	27.89	300	16.55	178	12.83	138	4
8	16.55	178	23.42	252	30.77	331	16.55	178	13.01	140	8
12	16.55	178	23.42	252	32.25	347	16.55	178	13.29	143	12
16	16.55	178	23.52	253	33.65	362	16.55	178	13.48	145	16
20	16.55	178	23.61	254	33.65	362	16.55	178	13.85	149	20
24	16.55	178	23.80	256	33.93	365	16.55	178	14.41	155	24
28	16.55	178	23.98	258	34.21	368	16.55	178	14.69	158	28
32	16.55	178	24.07	259	34.39	370	16.55	178	14.97	161	32
36	16.55	178	24.35	262	34.67	373	16.64	179	15.06	162	36
40	16.55	178	24.72	266	34.95	376	16.73	180	15.15	163	40
44	16.55	178	25.00	269	35.14	378	16.73	180	15.24	164	44
48	16.55	178	25.38	273	35.41	381	16.82	181	15.43	166	48
52	16.55	178	26.03	280	35.69	384	16.92	182	15.62	168	52
60	16.55	178	26.68	287	35.97	387	17.10	184	15.89	171	60
68	16.64	179	27.33	294	36.44	392	17.29	186	16.08	173	68
76	16.73	180	28.26	304	36.81	396	17.47	188	16.36	176	76
84	16.92	182	28.91	311	37.27	401	17.66	190	16.64	179	84
92	17.10	184	29.56	318	37.74	406	17.85	192	16.92	182	92
100	17.29	186	30.12	324	38.11	410	17.94	193	17.20	185	100
116	17.38	187			39.04	420	18.40	198			116
132	17.57	189			40.06	431	18.87	203			132
148	17.66	190			40.99	441	19.33	208			148
164							19.80	213			164
180							20.26	218			180
196							20.73	223			196



**Table 21145-2  
Multiple Aircraft Percentage Factors**

PRIMARY AIRCRAFT												
	A-4	TA-4	A-6	EA-6	KA-6	A-7	C-2	C-130	E-2	F-4		
S E C O N D A R Y  A I R C R A F T	A-4	--	26	12	21	8	13	27	28	17	14	A-4
	TA-4	11	--	12	25	11	9	11	14	11	10	TA-4
	A-6	N/A	N/A	--	28	N/A	44	N/A	N/A	39	N/A	A-6
	EA-6	N/A	N/A	34	--	N/A	51	N/A	N/A	44	N/A	EA-6
	KA-6	N/A	N/A	5	10	--	26	N/A	N/A	32	N/A	KA-6
	A-7	N/A	N/A	40	46	N/A	--	N/A	N/A	N/A	N/A	A-7
	C-2	N/A	N/A	28	34	28	28	--	N/A	5	N/A	C-2
	C-130	26	23	27	36	25	25	16	--	18	28	C-130
	E-2	N/A	N/A	39	40	30	36	N/A	N/A	--	N/A	E-2
	F-4	N/A	37	32	41	32	31	44	38	35	--	F-4
	F-14	N/A	N/A	44	47	N/A	36	N/A	N/A	N/A	N/A	F-14
	F/A-18	N/A	N/A	45	51	N/A	33	N/A	N/A	N/A	N/A	F/A-18
	AH-1T	21	32	22	32	21	21	32	31	21	23	AH-1T
	AH-1W	19	30	20	28	19	19	31	31	17	20	AH-1W
	UH-1	12	24	12	23	11	11	24	23	11	14	UH-1
	SH-2	23	22	24	33	23	23	24	23	21	24	SH-2
	SH-3	24	32	23	28	23	23	32	33	22	25	SH-3
	CH-46	27	38	28	30	27	27	38	36	25	30	CH-46
	CH-53	15	29	15	27	14	16	29	28	14	18	CH-53
	RH-53	N/A	N/A	52	57	N/A	51	N/A	N/A	49	N/A	RH-53
SH-60	N/A	N/A	28	27	27	27	36	N/A	28	N/A	SH-60	
P-3	N/A	N/A	49	60	N/A	48	N/A	N/A	47	N/A	P-3	
S-3	N/A	N/A	47	51	N/A	36	N/A	N/A	N/A	N/A	S-3	
AV-8	N/A	N/A	33	42	41	35	50	N/A	38	N/A	AV-8	
OV-10	21	31	19	33	23	12	35	29	22	26	OV-10	

**Table 21145-2 (Continued)  
Multiple Aircraft Percentage Factors**

		PRIMARY AIRCRAFT										
		F-14	F/A-18	AH-1T	AH-1W	UH-1	SH-2	SH-3	CH-46	CH-53	RH-53	
S E C O N D A R Y  A I R C R A F T	A-4	8	15	15	16	N/A	27	18	23	N/A	14	A-4
	TA-4	13	21	12	12	12	10	11	24	28	10	TA-4
	A-6	21	46	N/A	N/A	N/A	N/A	N/A	N/A	N/A	53	A-6
	EA-6	25	52	N/A	N/A	N/A	N/A	N/A	N/A	N/A	55	EA-6
	KA-6	27	32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	46	KA-6
	A-7	33	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A-7
	C-2	27	34	N/A	N/A	N/A	N/A	N/A	N/A	N/A	45	C-2
	C-130	27	33	24	27	N/A	25	25	31	N/A	25	C-130
	E-2	20	40	N/A	N/A	N/A	N/A	N/A	N/A	N/A	46	E-2
	F-4	31	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	33	F-4
	F-14	--	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	58	F-14
	F/A-18	45	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	F/A-18
	AH-1T	21	29	--	N/A	N/A	N/A	21	38	N/A	19	AH-1T
	AH-1W	18	24	5	--	N/A	N/A	19	23	N/A	16	AH-1W
	UH-1	12	21	6	24	--	23	12	17	N/A	9	UH-1
	SH-2	25	33	23	25	23	--	10	N/A	N/A	21	SH-2
	SH-3	23	31	N/A	N/A	N/A	N/A	--	31	N/A	19	SH-3
	CH-46	27	20	25	N/A	N/A	N/A	27	--	N/A	21	CH-46
	CH-53	15	24	10	12	11	28	13	19	--	7	CH-53
	RH-53	51	56	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--	RH-53
SH-60	27	32	N/A	N/A	N/A	N/A	N/A	N/A	N/A	45	SH-60	
P-3	19	45	N/A	N/A	N/A	N/A	N/A	N/A	N/A	62	P-3	
S-3	24	39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	S-3	
AV-8	33	26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	45	AV-8	
OV-10	24	26	16	N/A	N/A	N/A	20	22	N/A	19	OV-10	

**Table 21145-2 (Continued)  
Multiple Aircraft Percentage Factors**

		PRIMARY AIRCRAFT					
		SH-60	P-3	S-3	AV-8	OV-10	
S E C O N D A R Y  A I R C R A F T	A-4	25	36	16	16	16	A-4
	TA-4	24	23	14	21	11	TA-4
	A-6	N/A	49	44	N/A	N/A	A-6
	EA-6	N/A	55	51	N/A	N/A	EA-6
	KA-6	N/A	44	31	51	N/A	KA-6
	A-7	N/A	48	28	N/A	N/A	A-7
	C-2	37	27	22	51	47	C-2
	C-130	35	25	19	33	24	C-130
	E-2	N/A	45	34	50	N/A	E-2
	F-4	42	49	32	40	34	F-4
	F-14	N/A	56	16	N/A	N/A	F-14
	F/A-18	N/A	50	45	N/A	N/A	F/A-18
	AH-1T	30	38	20	29	18	AH-1T
	AH-1W	26	37	18	23	16	AH-1W
	UH-1	21	31	11	21	6	UH-1
	SH-2	34	22	15	32	23	SH-2
	SH-3	32	32	15	30	22	SH-3
	CH-46	36	31	27	19	22	CH-46
	CH-53	26	39	16	24	11	CH-53
	RH-53	N/A	63	52	N/A	N/A	RH-53
SH-60	--	42	27	50	44	SH-60	
P-3	N/A	--	43	N/A	N/A	P-3	
S-3	N/A	46	--	N/A	N/A	S-3	
AV-8	N/A	44	37	--	43	AV-8	
OV-10	32	30	12	30	--	OV-10	

**Table 21145-3  
Adjustment Factor for Small Avionics Divisions**

Gross Space (m <sup>2</sup> )	Gross Space (m <sup>2</sup> / SF)	Factor
929 – 1,208	10,000 – 12,999	.50
1,209 – 1,487	13,000 – 15,999	.55
1,488 – 1,765	16,000 – 18,999	.60
1,766 – 2,044	19,000 – 21,999	.65
2,045 – 2,323	22,000 – 24,999	.70
2,324 – 2,602	25,000 – 27,999	.75
2,603 – 2,881	28,000 – 30,999	.80
2,882 – 3,160	31,000 – 33,999	.85
3,161 – 3,439	34,000 – 36,999	.90
3,440 – 3,717	37,000 – 39,999	.95
3,718 and up	40,000 and up	1.00

**Example 1** - One type/model aircraft assigned.

There are 100 assigned aircraft of the type/model indicated in Column (1) below. Column (2) contains the basic space requirement from Table 21145-1.

Step 1.

Obtain basic space requirement for the type/model aircraft by entering Table 21145-1 with the quantity of aircraft to be supported.

<u>Column (1)</u>	<u>Column (2)</u>
100 F-14	3,727 m <sup>2</sup> (40,100 SF)

Since there is only one type/model assigned and the space requirement is over 3,718 m<sup>2</sup> (40,000 SF), no further computations are required.

Gross space allowance for Avionics Division – 3,727 m<sup>2</sup> (40,100 SF)

**Example 2** - One type/model aircraft assigned.

There are 8 assigned aircraft of the type/model indicated in Column (1) below. Column (2) contains the basic space requirement from Table 21145-1. Column (3) contains the adjustment factor for a small avionics division from Table 21145-3. Column (4) contains the adjusted space requirement.

Step 1.

Obtain basic requirement for the type/model aircraft by entering Table 21145-1 with the quantity of aircraft supported.

<u>Column (1)</u>	<u>Column (2)</u>
8 E-2	22,200 SF

Step 2.

Since the space requirement in Column (2) is less than 40,000 SF obtain the adjustment factor for small avionics divisions from Table 21145-3.

<u>Column (1)</u>	<u>Column (2)</u>		<u>Column (3)</u>		<u>Column (4)</u>
8 E-2	2,064 m <sup>2</sup>	x	.70	=	1,445 m <sup>2</sup>
	22,200 SF	x	.70	=	15,540 SF

Gross space allowance for Avionics Division – 1,445 m<sup>2</sup> (15,540 SF)

**Example 3** - Two Type/Model aircraft assigned

There are 144 assigned aircraft of the type/model and number indicated in Column (1) below. Column (2) contains the basic space requirements from Table 21145-1. Column (3) contains the percentage factor for the secondary aircraft (smallest basic space allowance). Column (4) contains the total space requirement.

Step 1.

Obtain basic space requirements for both type/model aircraft by entering Table 21145-1 with quantity of aircraft to be supported.

<u>Column (1)</u>	<u>Column (2)</u>
100 F-14	3,727 m <sup>2</sup> (40,100 SF)
44 F-4	1,534 m <sup>2</sup> (16,500 SF)

Step 2.

Obtain percentage factor for secondary aircraft by crossing from that aircraft in secondary column to the column under the prime aircraft (F-4 to F-14 = 35%) of Table 21145-2.

<u>Column (1)</u>	<u>Column (2)</u>	<u>Column (3)</u>
100 F-14	3,727 m <sup>2</sup> (40,100 SF)	
44 F-4	1,534 m <sup>2</sup> (16,500 SF)	31%

Step 3.

Enter 100% of prime aircraft basic space requirement (Column (2)) in Column (4). Calculate percentage (Column (3)) of secondary aircraft space requirement (Column (2)) and enter in Column (4). Add requirements of Column (4) for total avionics division requirement.

<u>Column (1)</u>	<u>Column (2)</u>		<u>Column (3)</u>	=	<u>Column (4)</u>
100 F-14	3,727 m <sup>2</sup>	x	1.00	=	3,727 m <sup>2</sup>
	40,100 SF	x	1.00	=	40,100 SF
	1,534 m <sup>2</sup>	x	0.31	=	476 m <sup>2</sup>
44 F-44	16,500 SF	x	0.31	=	<u>5,115 SF</u>
					4,203 m <sup>2</sup>
					45,215 SF

Gross space allowance for Avionics Division – 4,203 m<sup>2</sup> (45,215 SF)

**Example 4** - Three or more Type/Model aircraft assigned

There are 196 assigned aircraft of the type/model and number indicated in Column (1) below. Column (2) contains the basic space requirements from Table 21145-1 in descending order of size. Column (3) contains the lowest percentage factor from Table 21145-2 for each secondary type aircraft when considered against those with larger basic space requirements as prime. Column (4) contains the total space requirement.

Step 1.

Obtain basic space requirements for both type/model aircraft by entering Table 21145-1 with quantity of aircraft to be supported.

<u>Column (1)</u>	<u>Column (2)</u>
100 F-14	3,727 m <sup>2</sup> (40,100 SF)
28 E-2	2,240 m <sup>2</sup> (24,100 SF)
44 F-4	1,534 m <sup>2</sup> (16,500 SF)
24 TA-4	995 m <sup>2</sup> (10,700 SF)

Step 2.

Select lowest percentage factor for secondary type aircraft for Column (3) by crossing from that aircraft in secondary column and considering each aircraft assigned with a larger basic space requirement as a prime aircraft.

a. The E-2 has only the F-14 with a larger basic space requirement therefore 20% will be used in Column (3).

b. The F-4 has both the E-2 (35%) and the F-14 (31%) with larger basic requirements. The F-14 has the lowest percentage factor (31%) so this will be entered in Column (3).

c. The TA-4 has all the other types with larger basic space requirements. The E-2 (11%) has a lower percentage factor than the F-14 (13%), but a higher percentage factor than the F-4 (10%); therefore, 10% shall be entered in Column (3).

Step 3.

Enter 100% of prime aircraft basic space requirement in Column (4). Calculate percentage (Column (3)) of secondary aircraft space requirement (Column (2)) and enter in Column (4). Add requirements of Column (4) for total avionics division requirement.

<u>Column (1)</u>	<u>Column (2)</u>		<u>Column (3)</u>	=	<u>Column (4)</u>
100 F-14	3,727 m <sup>2</sup>	x	1.00	=	3,727 m <sup>2</sup>
	40,100 SF	x	1.00	=	40,100 SF
28 E-2	2,240 m <sup>2</sup>	x	0.20	=	448 m <sup>2</sup>
	24,100 SF	x	0.20	=	4,820 SF
44 F-44	1,534 m <sup>2</sup>	x	0.31	=	476 m <sup>2</sup>
	16,500 SF	x	0.31	=	5,115 SF
24 TA-4	995 m <sup>2</sup> x	0.10		=	100 m <sup>2</sup>
	10,700 SF	x	0.10		<u>1,070 SF</u>
					4,751 m <sup>2</sup>
					51,105 SF

Gross space allowance for Avionics Division – 4,751 m<sup>2</sup> (51,105 SF)

211 50 AIRCRAFT ARMAMENT/MISSILE REWORK SHOP (NAVAIR DEPOT)  
 (m<sup>2</sup> / SF)  
**FAC: 2116**  
**BFR Required: Y**

21150-1 **GENERAL.** An Aircraft Armament/Missile Rework Shop is required to provide space associated with processing weapons including guns, missiles, bomb racks, weapon pylons, etc., used by aircraft in carrying out its assigned mission.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 51 DEDICATED AIRCRAFT ARMAMENT/MISSILE REWORK SHOP –  
GENERAL PURPOSE (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21151-1 **GENERAL.** A Dedicated Aircraft Armament/Missile Rework – General Purpose Shop is required for the Armament Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Armament Dedicated Cleaning Shop
- b. Armament Dedicated Paint Shop
- c. Armament Dedicated Machine Shop
- d. Armament Dedicated Welding Shop
- e. Armament Dedicated Plating Shop
- f. Aircraft Weapon Overhaul and Test Shop
- g. Ordnance Equipment Shop
- h. Weapon Accessories Repair Shop – Facility for the repair of bomb racks, weapon pylons, etc.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 52 AIRCRAFT WEAPON OVERHAUL AND TEST SHOP (NAVAIR DEPOT)  
(m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21152-1 **GENERAL.** An Aircraft Weapon Overhaul and Test Shop is required for the Armament Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Aircraft Weapon Overhaul and Test Shop
- b. Ordnance Equipment Shop
- c. Weapon Accessories Repair Shop – Facility for the repair of bomb racks, weapon pylons, etc.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 53 AIR LAUNCHED MISSILE REWORK SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21153-1 **GENERAL.** An Air Launched Missile rework Shop is required to provide space for the repair of air launched missiles for the Armament Production Shop of the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 54 AIRCRAFT ARMAMENT SYSTEM SHOP (NON-NAVAIR DEPOT) (m<sup>2</sup> / SF)

**Refer to the following publications for AAS storage facility preservation criteria:**  
CNAFINST 8380.2 and NAVAIR 15-01-500

**FAC: 2112**

**BFR Required: Y**

21154-1 **GENERAL.** Prior to commencing any I-Level facilities projects, coordination and planning must be conducted with the Command for which the facility is intended. Consideration must be made for other required duties of the occupying section. The Aircraft Armament Systems (AAS) shop and shops related to AAS sub-systems may be called different names. Within a Navy Command these shops fall under the Ordnance Division in the Maintenance Department. At a Marine Aviation Logistics Squadron (MALS), the AAS shop is under the Ordnance Department and not under the cognizance of the Maintenance Department. MALS Ordnance has the additional responsibilities of operating a Munitions shop, an Ammunition Stock Recording Section (ASRS), a Tool Room, a Production Control (PC) section, and an administrative section.

An Aircraft Armament Systems (AAS) shop is required at Navy and Marine Corps Intermediate Level (I-Level) maintenance activities to support combat aircraft. AAS encompasses five distinct subsystems; Aircraft Armament Equipment (AAE), Aircraft Gun Systems (AGS), Aircraft Crew Served Weapons (ACSW), ACSW mounts, and Laser Aiming Devices (LAD). Although missiles and rockets are handled at the missile maintenance shop or rocket assembly and loading areas, maintenance of AAS launchers is conducted in the AAS shop.

Aircraft that require support from this shop can be classified in three general groups, the attack/fighter group which require extensive support, the Anti-submarine Warfare (ASW), and Transport groups which require much less support. Table 21154-1 below



lists the aircraft in each group. The Navy/Marine Corps aircraft that do not appear in either group generally do not require support from an AAS shop.

**Table 21154-1  
Aircraft Classification**

Attack/Fighter	ASW	Transport
F-35	SH-60	KC-130HH
F/A-18	P-3	CH-53
AV-8	S-3	MV-22
AH-1/UH-1	P-8	
E/A-6		

The determination of gross square footage requirements for a given air installation is accomplished through the use of Table 21154-2 Space Allowance for Basic Aircraft Armament System Division, Table 21154-3 Space Allowance for AAS Pool, and Table 21154-4 Space Allowance for the Armament Weapons Support Equipment (AWSE) Work Center (for those activities having this responsibility). (Type Commander 8380 series instructions determine which activities have Aircraft Armament System Equipment Pool responsibilities).

Initially Table 21154-2 is entered in Column (1) using the total number of assigned attack and fighter aircraft. The gross area is read in Column (2). For those activities without any attack or fighter aircraft but having other type aircraft that require Armament Division support, such as P-3, S-3, etc., enter Column (1) with total number of these aircraft. The required gross area is read in Column (3).

**Table 21154-2  
Space Allowance for  
Basic Aircraft Armament System Division**

Column (1) No. Aircraft	Column (2) Attack/Fighter (m <sup>2</sup> )	Column (2) Attack/Fighter (SF)	Column (3)* ASW (m <sup>2</sup> )	Column (3)* ASW (SF)
Up to 50	325	3,500	251	2,700
51-75	409	4,400	288	3,100
76-100	465	5,000	325	3,500
101-125	502	5,400		
126-175	567	6,100		
176-225	623	6,700		
226 +	651	7,000		

\*Do not use when activity also supports attack and/or fighter aircraft, use allowance from Column (2) only.

The above space allowances include space for degreasing, storage of guns, administration, production control, training, supply and tool room, male and female personnel facilities and a mechanical equipment room. If an I-level facility utilizes and

stores Aircraft Crew Served Weapons (ACSW), the area which these systems are stowed must meet the Unified Facilities Criteria for Armories, Refer to UFC 4-215-1 (i.e. physical security and humidity controlled).

**Example Computation 1** – Aircraft Armament Systems Shop

Assigned aircraft:	80 F-35
	56 F/A-18A
	<u>42</u> S-3A
Total	178

Since base loading includes attack and fighter aircraft, only those numbers are used to enter Table 21154-2. Therefore, Column (1) is entered with 136 aircraft. A required area of 567 m<sup>2</sup> (6,100 SF) is read from Column (2).

**Example Computation 2** – Aircraft Armament Systems Shop

Assigned aircraft:	42 P-3C
	<u>22</u> CH-53
Total	64

This base loading does not include either attack or fighter aircraft, consequently the total number of aircraft is used to enter Table 21154-2. Entering Column (1) with 64 aircraft, a required area of 288 m<sup>2</sup> (3,100 SF) is read from Column (3).

Activities that have the assigned responsibilities of maintaining an Aircraft Armament System Equipment Pool, the basic shop requirement from Table 21154-2 will be increased by the requirement from Table 21154-3.

**Table 21154-3  
Space Allowance for  
Aircraft Armament System Equipment Pool**

Column (1) Aircraft	Column (2) Area Per Aircraft (m <sup>2</sup> )	Column (2) Area Per Aircraft (SF)
E/A-6	3	32
F-35	6.1	66
F/A-18	5.9	64
AH-1/UH-1	5	54
MV-22	1.11	12
CH-53	7.1	76
SH-60	0.5	5
P-3	1.1	12
S-3	0.9	10
P-8	0.5	5
AV-8B	3.5	38
KC-130HH	1.11	12

The above allowance provides space for Pool storage and the issuing and receiving functions only. Administrative and other support functions are provided in the basic allowance from Table 21154-2.

**Example Computation 3** – Aircraft Armament System Equipment Pool

Assigned aircraft are identical to Example Computation 1 above, however pool support is also provided for 30 SH-60B at another station.

Type A/C (Column (1))	Area Per A/C (m <sup>2</sup> ) (Column (2))	Area Per A/C (SF) (Column (2))	Number A/C	m <sup>2</sup>	SF
F-35	6.1	66	80	488	5,253
F/A-18A	5.9	64	56	330	3,552
S-3A	0.9	10	42	38	409
SH-60B	0.5	5	30	<u>15</u>	<u>161</u>
Total space requirement				871	9,375

This requirement is added to the basic requirement from Table 21154-2, 567 m<sup>2</sup> (6,100 SF), to give a total requirement of 1,438 m<sup>2</sup> (15,475 SF) for the Aircraft Armament System Shop.

Marine Corps activities have the additional responsibility of conducting maintenance on AWSE. Space for this added function is provided by Table 21154-4. It is based on the activities' allowance for weapons trailers.

**Table 21154-4  
Space Allowance for  
Armament Weapons Support Equipment Work Center**

Column (1) Type Trailer	Column (2) Area Per Trailer (m <sup>2</sup> )	Column (2) Area Per Trailer (SF)
AM32K-10	2.3	25
MHU-151/M	1.4	15

The above allowance provides space for the AWSE work center only. Administration and other support functions are provided in the basic allowance from Table 21154-2.

**Example Computation 4** – Aircraft Armament Systems Shop

A Marine Corps activity has a base loading as shown below, with the armament equipment pool responsibility for the same number and type aircraft.

Base loading: 20 AV-8 Aircraft

- 24 AH-1Z Aircraft
- 16 CH-53E Aircraft
- 15 F-35 Aircraft
- 25 AM32K-10 Trailers
- 28 MHU-151/M Trailers

a.) Basic shop requirement

Attack Aircraft:	20 AV-8
	24 AH-1
	<u>15</u> F-35
Total	<u>59</u>

Enter Table 21154-2, Column (1) with 59 aircraft. A required area of 409 m<sup>2</sup> (4,400 SF) is read from Column (2).

b.) Aircraft Armament System Equipment Pool

Type A/C (Column (1))	Area Per A/C (m <sup>2</sup> ) (Column (2))	Area Per A/C (SF) (Column (2))	Number A/C	m <sup>2</sup>	SF
AV-8	3.5	38	20	70	753
AH-1Z	5	54	24	120	1,292
CH-53E	7.1	76	16	114	1,227
F-35	6.1	66	15	<u>92</u>	<u>990</u>
Total space requirement				396	4,262

c.) Armament Weapons Support Equipment Work Center

Type Trailer	Area per Trailer (m <sup>2</sup> )	Area per Trailer (SF)	No. Trailer	m <sup>2</sup>	SF
AM32K-10	2.3	25	25	58	624
MHU-151/M	1.4	15	28	<u>39</u>	<u>420</u>
Total space requirement				97	1,044

Total gross square feet for Aircraft Armament System Shop

	m <sup>2</sup> .	SF
a.) Basic Shop Requirement	409	4,400
b.) Equipment Pool Requirement	396	4,262
c.) Support Equipment W/C Requirement	<u>97</u>	<u>1,044</u>
Total	902	9,706

211 55 AVIATION ARMAMENT SUPPORT EQUIPMENT HOLDING SHED (NON-NAVAIR DEPOT) (m<sup>2</sup> / SF)

Refer to the following publications for AAS storage facility preservation criteria:  
CNAFINST 8380.2 and NAVAIR 15-01-500

**FAC: 4412**  
**BFR Required: N**

21155-1 **GENERAL.** For Marine Corps activities, an aviation armament support equipment holding shed is planned in conjunction with the Category Code 211 54, Aircraft Armament System Shop. The shed provides cover for weapons trailers, bomb cradles, and other armament support equipment and is an integral part of Marine Aviation Logistics Squadrons' Ordnance Department.

The holding shed requirement is based on a unit space for each weapons trailer in accordance with Table 21155-1. The gross square feet requirement is sized by multiplying the unit space for each type trailer by the activity's trailer allowance.

**Table  
21155-1  
Space Allowance for Armament Weapons Support  
Equipment Holding Shed**

Type Trailer	Area per Trailer (m <sup>2</sup> )	Area per Trailer (SF)
A/M32K-10	12.4	133
MHU-151/M	6.7	72
U-21	12.4	133

**Example Computation 1** – Holding Shed

A Marine Aviation Logistics Squadron (MALS) has an allowance of thirty AM32K-10 trailers and twenty-five of the smaller MHU-151/M trailers, and one U-21 maintenance trailer.

Type Trailer	Area per Trailer (m <sup>2</sup> )	Area per Trailer (SF)	No. Trailer	m <sup>2</sup>	SF
A/M32K-10	12.4	133	30	372	3,990
MHU-151/M	6.7	72	25	168	1,800
U-21	12.4	133	1	12.4	133
			Total	552.4	5,923

211 60 SUPPORT EQUIPMENT REWORK SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21160-1 **GENERAL.** A Support Equipment Rework Shop is required to provide space associated with processing aviation general and special support equipment and aerospace ground support equipment.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 61 DEDICATED SUPPORT EQUIPMENT REWORK GENERAL PURPOSE SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21161-1 **GENERAL.** A Dedicated Support Equipment Rework General Purpose Shop is required for the Support Equipment Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Support Equipment Dedicated Cleaning Shop
- b. Support Equipment Dedicated Paint Shop
- c. Support Equipment Dedicated Machine Shop
- d. Support Equipment Dedicated Plating Shop
- e. Support Equipment Dedicated Welding Shop

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 62 SUPPORT EQUIPMENT CALIBRATION SHOP (NAVAIR DEPOT)  
(m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21162-1 **GENERAL.** A Support Equipment Calibration Shop is required for the Support Equipment Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Aeronautical Electronic Support Equipment Shop – Includes mobile maintenance facility construction, outfitting and repair.

- b. Electronic Test Systems Repair Shop – Facility for the repair of VAST, ATE, etc.
- c. Precision Measurement Equipment Shop – Facility used to repair, calibrate and certify precision measurement and test equipment.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 63            GROUND SUPPORT EQUIPMENT REWORK SHOP (NAVAIR DEPOT)  
(m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21163-1            **GENERAL.** A Ground Support Equipment Rework Shop is required for the Support Equipment Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. GSE Maintenance Shop – Facility used for the servicing and maintaining of ground support equipment such as work stands, firefighting equipment, portable air conditioners, air compressors, generators, etc..
- b. Training Devices Shop – Facility used to repair and modify training aids such as mock-ups, cut away models, etc.
- c. Hydrostatics Shop – Facility used to periodically inspect and overhaul of hydrostatic equipment.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 64            GROUND SUPPORT EQUIPMENT HOLDING SHED (NAVAIR DEPOT)  
(m<sup>2</sup> / SF)

**FAC: 2185**

**BFR Required: Y**

21164-1            **GENERAL.** A Ground Support Equipment Holding Shed is required for the Support Equipment Production Shop of the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 65 AIRBORNE WEAPONS SUPPORT EQUIPMENT SHOP (NAVAIR DEPOT) (EA)

**FAC: 2112**

**BFR Required: Y**

21165-1 **GENERAL.** An Airborne Weapons Support Equipment Shop is required for the Support Equipment Production Shop of the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 70 MANUFACTURING AND REPAIR SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21170-1 **GENERAL.** A Manufacturing and Repair Shop is required to provide space for aircraft repair operations by such work functions as parts cleaning and painting, plating and metal processing shop.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 71 DEDICATED MANUFACTURING AND REPAIR – GENERAL PURPOSE SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21171-1 **GENERAL.** A Dedicated Manufacturing and Repair - General Purpose Shop is required for the Manufacture and Repair Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Welding Shop
- b. Foundry Shop
- c. Peening and Blasting Shop
- d. Non-destructive Inspection – Magnetic particle, Dye Penetrant, etc..
- e. Parts Cleaning Shop
- f. Parts Painting Shop

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.



211 72 METAL FABRICATION/MANUFACTURING SHOP (NAVAIR DEPOT)  
(m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21172-1 **GENERAL.** A Metal Fabrication/Manufacturing Shop is required for the Manufacture and Repair Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Machine Shop
- b. Grinding Shop – Facility is used primarily for close tolerance grinding of metal parts that have been built up by metalizing or electroplating processes.
- c. NC Machine Shop – Facility primarily using numerically controlled machines; separate from common machine shop.
- d. Metal Parts Fabrication Shop

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 73 METAL TREATMENT SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21173-1 **GENERAL.** A Metal Treatment Shop is required for the Manufacture and Repair Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Metal Processing Shop – Facility for metal treating processes such as nickel braze, ceramic coating, plasma, etc.
- b. Plating Shop
- c. Heat Treating Shop – Facility for heat treating metals such as tempering, annealing, quenching, stress relieving, etc.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 74 NON-METAL FABRICATION/MANUFACTURING SHOP (NAVAIR DEPOT) (EA)

**FAC: 2116**

**BFR Required: Y**

21174-1 **GENERAL.** A Non-Metal Fabrication/Manufacturing Shop is required for the Manufacture and Repair Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Plastic Fabrication Shop – Facility for the manufacture of plastic items such as tubing, caps, covers, panels, foam container liners, templates, fixtures and tooling.
- b. Pattern Shop
- c. Decal (Graphic Arts) Shop
- d. Woodworking Shop
- e. Rubber Fabrication Shop – Facility for fabrication of rubber equipment such as aircraft fuel cells and molded rubber products.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 75 AVIATION LIFE SUPPORT SYSTEMS SHOP (NON-NAVAIR DEPOT)  
(m<sup>2</sup>/ SF)

**FAC: 2184**

**BFR Required: Y**

**Design Criteria:** Military Handbook (MIL-HDBK) 1028/1C, Aircraft Maintenance Facilities

21175-1 **GENERAL.** An Aviation Life Support Systems Shop is required at Navy and Marine Corps air installations for inspecting, repairing, and repacking of parachutes, flotation devices, oxygen and other life support equipment. See basic Category 211 Supplement, Maintenance, Aircraft spares for Marine Corps Aircraft Maintenance Facilities, for which special guidance is provided.

21175-2 **APPLYING CRITERIA.** To determine the gross square footage requirements for a given air installation, the number of each type assigned aircraft, Column (1), is multiplied by the corresponding sizing factor in Column (2) of Table 21175-1. The sum of the products for each type of aircraft becomes the “basic sizing factor” which determines the number of packing tables required. This is used to enter Table 21175-2 to obtain the basic area allowance. Add to this the square footage of the largest sized Aviators Safety Equipment (Flotation) Shop from Column (3) and the largest sized Oxygen Regulator and Equipment Shop from Column (4) of Table 21175-1 to obtain the “gross square foot” requirement.

The basic area allowance from Table 21175-2 includes the following support spaces:

- Male and Female lavatories and lockers
- Training/Conference room
- Administrative office
- Sewing/Fabrication room
- Production Control
- Storage area
- Washer and Dryer room
- Mechanical room

In the one (1) packing table shop no separate areas are planned for the training/conference, sewing/fabrication rooms nor the administrative office. Space is planned within the production control area for the administrative functions, while the other functions are planned for within the packing table area.

Planning factors do not include space for a parachute hanging tower, a Liquid Oxygen (LOX) Farm nor for an Ejection Seat Shop. If an intermediate maintenance activity plans to operate/maintain a LOX Farm and/or an Ejection Seat Shop or has a special requirement for a hanging tower, such as support of a SEAL team, space allocation must be justified separately.

**Table 21175-1  
Sizing Factors for  
Aviation Life Support Systems Shop**

<b>Column (1) Type A/C</b>	<b>Column (2) Parachute Shop Factor</b>	<b>Column (3) Flotation Shop</b>	<b>Column (4) Oxygen Shop</b>
A-4	0.0016	M	L
TA-4	0.0032	M	L
A-6	0.0032	M	L
EA-6	0.0064	M	L
A-7	0.0016	M	L
TA-7	0.0032	M	L
C-2	0.0032	L	L
C-130	0.0064	L	S
E-2	0.0080	M	L
F-4	0.0032	M	L
F-14	0.0032	M	L
F/A-18	0.0016	M	L
TF/A-18	0.0032	M	L
H-1	0.0001	S	S

Column (1) Type A/C	Column (2) Parachute Shop Factor	Column (3) Flotation Shop	Column (4) Oxygen Shop
H-2	0.0001	S	S
H-3	0.0001	L	S
H-46	0.0001	L	S
H-53	0.0001	L	S
H-60	0.0001	L	S
P-3	0.0368	L	S
S-3	0.0064	M	L
T-2	0.0032	M	S
AV-8	0.0016	M	L
TAV-8	0.0032	M	L
OV-10	0.0032	M	S
<b>Values of Column (3) S = 300 Sq.Ft. M = 500 Sq.Ft. L = 900 Sq.Ft.</b>		<b>Value of Column (4) S = 300 Sq.Ft. L = 500 Sq.Ft.</b>	

**Table 21175-2  
Basic Allowance for  
Aviation Life Support Systems Shop**

Factor Total	Basic Allowance
0 to 1	3,000 Sq.Ft.
More than 1 to 2	5,000 Sq.Ft.
More than 2	6,000 Sq.Ft.

Example Computation 1

A/C	No.	Column (2)	Factor Product	Column (3)	Column (4)
F-14	120	0.0032	0.3840	M	L
TA-4	18	0.0032	0.0576	M	L
A-4	6	0.0016	0.0096	M	L
E-2	30	0.0080	<u>0.2400</u>	<u>M</u>	<u>L</u>
			0.6912	M	L

From Table 211-75B      0.6912 = 3,000 Sq.Ft.  
From Table 211-75A    Column (3) "M" = 500 Sq.Ft.  
From Table 211-75A    Column (4) "L" = 500 Sq.Ft.  
4,000 Sq.Ft.



There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 80 TEST AND CALIBRATION SHOP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21180-1 **GENERAL.** A Test and Calibration Shop is required to provide space dedicated to test, trim, or calibrate engines, electronics, communications or armament systems. This is the main Category Code used for the Test and Calibration Production Shop of the Naval Air Depot (NADEP).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 81 ENGINE TEST CELL (NON-NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2118**

**BFR Required: Y**

**Design Criteria:** UFC 4-212-01, Navy Standard Jet Engine Test Cells

21181-1 **GENERAL.** An engine test cell provides an acoustically attenuated and fully instrumented enclosure in which uninstalled turbojet and turbofan engines are tested at installations where intermediate level maintenance engine repair work is performed. The enclosure provides a better working environment than open pads by providing protection from inclement weather and cross winds which adversely affect testing of engines, while at the same time significantly reducing exterior noise levels. NAVFAC P-970, Planning in the Noise Environment, specifies acceptable noise levels for various land uses. See Category Code 211 01, Aircraft Acoustical Enclosure (Non-NAVAIR Depot), for P-970 requirements.

Current Navy aircraft inventory includes two types of jet engines: turbo fan/turbo jet engines and turbo shaft jet engines, which power aircraft with rotors or propellers. The test cells for these two types of engines would differ in size due the differences in power requirements, volume of exhaust, and noise levels.

This facility shall support out of frame testing for the Intermediate-level Engine Maintenance Shop (Non-NAVAIR Depot), Category Code 211 21.

The facility includes spaces for engine mounts, fueling system, and observation and control. Engine test stands and Power Check Pads, without Sound Suppression (Non-NAVAIR Depot), Category Code 211 89 or with Sound Suppression (Non-NAVAIR

Depot), Category Code 211 88, are normally authorized for all stations or activities requiring jet engine test facilities.

When possible, the Test Cell should be sited close to the Engine Maintenance Shop. It will require paved access road for towing engines from the shop. Consideration should be given to enclosing existing open Power Check Pads.

The number of test cells required is based on total monthly engine runs required and availability of a test cell for testing. The total monthly engine runs would be determined by the program management activity involved for each engine. The required monthly production could be estimated from total flight hours, number squadrons, and number of engine runs for each engine. The availability of a cell available for testing runs on a monthly basis can be determined with input from Fleet Readiness Center and NAVAIR Aircraft Engine Test System (AETS) Fleet Support Team (FST) based on operational data. It is estimated that 60% to 80% of the time a test cell is in operation is available for engine testing due to maintenance requirements, scheduled or unscheduled. For a newer test cell, percentage availability is closer to 80% whereas an older test cell is expected to be available closer to 60% of the time.

Beside availability, several other factors impact production rate including the time required for each engine run, number of shifts available for a test cell, and number of days a test cell is in operation on a monthly basis.

The following example illustrates the methodology for defining the requirement for test cells at Naval Air Oceana Test Cell involving two engines for F/A 18A-F aircraft.

**Table 21181-1  
Out-Of-Frame Engine Test Facility Requirements  
Global Engine Repair  
Naval Air Station Oceana**

<b>Item Description</b>	<b>Unit</b>	<b>Value</b>	<b>Note/Computation</b>
<b><i>Total Monthly Engine Runs Required</i></b>			
Required production per month (projected up to the next 5-yrs)	F404 Engine	17	Data obtained from PMA
	F414 Engine	18	Data obtained from PMA
Total monthly production requirement	Engine Tests/Mo	35	Sum of monthly productions for all engines
Number of engine runs per engine test	Engine Runs/ Engine Test	2	Requirement set by PMA
Total monthly engine runs required	Engine Runs/Mo	70	Total monthly production requirement X Number of engine runs per engine test

Item Description	Unit	Value	Note/Computation
<b>Monthly Engine Runs Per Cell</b>			
Time required for one engine run	Hrs	8	Data obtained from test cell operation
Shifts per available day		2	Average based on annual operation
Operating hours per shift	Hrs	8	Data obtained from test cell operation
Operating hours per day	Hrs	16	Shifts per available day X Operating hours per shift
Number of days test cell is available per month	Days/Cell/Mo	20	Average based on annual operation
Operating hours per cell per month	Hrs/Cell/Mo	160	Operating hours per day X Number of days test cell is available per month
Availability of test cell for engine testing	Percentage	60%	Average based on annual operation, determined with input from FRC/AETS FST
Available hours for engine testing per cell per month	Hrs/Cell/Mo	96	Operations hours per cell per month X Availability of test cell for engine testing
Monthly engine runs per test cell	Engine Runs/Cell/Mo	24	Available hours for engine testing per month / Time required for one engine run
<b>Number of Test Cells Required</b>			
Number of test cells required	Cells	2.92	Total monthly engine runs required / Monthly engine runs per test cell
Number of test cells required, rounded up	Cells	3	

211 82 AIRCRAFT WEAPONS ALIGNMENT SHELTER (NON-NAVAIR DEPOT)  
(m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21182-1 **GENERAL.** A minimum of one aircraft weapons alignment shelter is required at Navy and Marine Corps air installations having fighter or attack aircraft which require alignment of on-aircraft weapons systems. In addition to weapons



systems alignment, which is the process of mechanically and electrically aligning aircraft weapons electronic systems to a common aircraft axis, this facility provides space for on-aircraft electronic maintenance of the weapons systems. For the mechanical alignment of guns attached to aircraft, see Aircraft Boresight Range (Non-NAVAIR Depot), Category Code 211 09. If vehicle and aircraft access pavement is required, see Category Code 851 10, Roads, and 113 40, Aircraft Access Apron.

To determine the square footage requirements for a given air installation, the number of assigned aircraft of the types that require weapons calibration is first determined. This number is used to enter column 1 of Table 21182-1. Columns 2 and 3 of Table 21182-1 show the number of bays and gross area of structure required respectively.

**Table 21182-1  
Space Allowances for Aircraft Weapons Alignment Shelter**

Column 1	Column 2	Column 3
No. A/C	No. Bays	Gross Area m <sup>2</sup> (SF)
Up to 20	1	488 (5,246)
21 to 41	2	969 (10,423)
42-63	3	1,441 (15,503)
64-87	4	1,913 (20,583)
88-114	5	2,385 (25,663)
115-145	6	2,858 (30,743)
146-181	7	3,330 (35,822)
182-223	8	3,802 (40,902)
224-272	9	4,274 (45,983)
over 272	10	4,746 (51,063)

211 83 ENGINE TEST CELL (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2118**

**BFR Required: Y**

21183-1 **GENERAL.** An Engine Test Cell is required for the Test and Calibration Production Shop of the Naval Air Depot (NAVAIR Depot). Included within this Category Code are:

- a. Jet Engine Test Cell (10,000 – 16,000 lbs. maximum thrust)
- b. Jet Engine Test Cell (Over 16,000 lbs. maximum thrust)
- c. Jet Engine Test Stand – Facility for testing jet aircraft engines which has no acoustical noise abatement and is not part of an enclosed facility.
- d. Turbo Prop Test Cell
- e. Reciprocating Engine Test Cell (3,000 HP or less)
- f. Reciprocating Engine Test Cell (Over 3,000 HP)

- g. Reciprocating Engine Test Stand - Facility for testing reciprocating aircraft engines which has no acoustical noise abatement and is not part of an enclosed facility.
- h. Turbo Shaft Test Cell
- i. Turbo Fan Test Cell
- j. Pneumatic Gas/Air Turbine Test Cell

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 84 HELICOPTER BLADE TEST FACILITY (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21184-1 **GENERAL.** A Helicopter Blade Test Facility is required for the Test and Calibration Production Shop of the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 85 RADOME TEST FACILITY (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21185-1 **GENERAL.** A Radome Test Facility is required for the Test and Calibration Production Shop of the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 86 RADAR/ANTENNA TEST FACILITY (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21186-1 **GENERAL.** A Radar/Antenna Test Facility is required for the Test and Calibration Production Shop of the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 87 AIRCRAFT WEAPONS ALIGNMENT/BORESIGHT FACILITY (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21187-1 **GENERAL.** An Aircraft Weapons Alignment/Boresight Facility is required for the Test and Calibration Production Shop of the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 88 POWER CHECK PAD WITH SOUND SUPPRESSION (NON-NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2118**

**BFR Required: Y**

21188-1 **GENERAL.** Power check pads provided with fixed or portable sound suppressors which meet desired noise criteria are categorized here. Planning is the same as in Category Code 211-89. NAVFAC P-970 provides an analytical method for evaluating location of the power check pad with respect to inhabited areas. It shows how to calculate the expected noise levels and estimate the probable response to the noise. This noise survey is essential for substantiating the requirement for a power check pad with sound suppression.

211 89 POWER CHECK PAD WITHOUT SOUND SUPPRESSION (NON-NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2118**

**BFR Required: Y**

21189-1 **GENERAL.** Navy and Marine Corps air installations where aircraft are permanently assigned and aircraft maintenance is performed require power check facilities. The power check pad is used to test and adjust engines mounted in the aircraft, in-frame testing. Employing portable engine test stands, the power check pad is used for uninstalled engine testing. A power check pad includes Portland cement concrete airfield pavement with securing fittings, and, where required, protection walls and blast deflectors. NAVFAC P-970, Planning in the Noise Environment, specifies acceptable noise levels for various land uses. See Category Code 211 01, Aircraft Acoustical Enclosure (Non-NAVAIR Depot), for P-970 requirements.

Power check pads without sound suppression shall only be planned when a noise survey, as laid out in P-970, has shown that the location will not result in the need for sound suppression.

One power check pad for in-frame testing shall be planned to support up to 140 aircraft and two will support up to 360 aircraft. Out-of frame testing facilities should be planned in conjunction with Category Code 211 81, Engine Test Cell (Non-NAVAIR Depot). The power check pad should be at least 610 meters (2,000 feet) from any other activity, and preferably at greater distances from administrative, training, housing, and other inhabited buildings in order to reduce the sound suppression requirement. When used for uninstalled engine testing, the power check pad includes provision for portable fueling and instrumentation equipment and must be located for ready accessibility from the Engine Maintenance Shops, Category Code 211 21. At existing airfields, maximum use shall be made of surplus airfield pavement that can be modified to satisfy the power check pad requirement.

211 90 OTHER SUPPORT FACILITIES (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21190-1 **GENERAL.** The Other Support Facilities are those areas used to perform productive NAVAIR Depot work that have not been previously identified. This includes ramp, apron, and aircraft storage sites.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 91 UNCOVERED RAMP (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2118**

**BFR Required: Y**

21191-1 **GENERAL.** Uncovered Ramp is required to perform NAVAIR Depot-specific maintenance and production functions. Included within this Category Code are:

- a. Aircraft Rework Apron – Uncovered areas specifically assigned for NAVAIR Depot maintenance.
- b. Reclamation Apron – Uncovered areas assigned to depot maintenance used for performing aircraft reclamation work.
- c. Armament and Disarmament Pad
- d. Pre-dock /Post-dock Apron
- e. Aircraft Corrosion Control Facility (Uncovered)
- f. Ground Check/Flight Test Support (Uncovered)

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 92 COVERED GROUND CHECK/FLIGHT TEST FACILITY (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21192-1 **GENERAL.** A Covered Ground Check/Flight Test Facility is required for the Naval Air Depot (NAVAIR Depot).

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 93 ENGINEERED LAB (NAVAIR DEPOT) (m / SF)

**FAC: 2116**

**BFR Required: Y**

21193-1 **GENERAL.** An Engineering Lab is required to provide space to support NAVAIR Depot-specific maintenance and production functions. Included within this Category Code are:

- a. Material Handlers/Parts Expeditors
- b. Material Control Laboratory
- c. Standards Laboratory
- d. Programmer's – Automatic Test Equipment and Numerical Controlled Machine

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 94 AIRCRAFT POWER CHECK FACILITIES (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2118**

**BFR Required: Y**

21194-1 **GENERAL.** Aircraft Power Check Facilities are required to perform NAVAIR Depot-specific maintenance and production functions. Included within this Category Code are:

- a. Power Check Pad (No Sound Suppression)

- b. Power Check Pad (With Sound Suppression)
- c. Propeller Aircraft Power Check Pad
- d. Helicopter Aircraft Power Check Pad
- e. VSTOL Aircraft Power Check Pad

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 95 MATERIAL AND EQUIPMENT STAGING/STORAGE FACILITY (NAVAIR DEPOT) (m<sup>2</sup>/ SF)

**FAC: 2116**

**BFR Required: Y**

21195-1 **GENERAL.** A Material and Equipment Staging/Storage Facility for Naval Air Depot (NAVAIR Depot) is required to provide space for Packaging and Preservation of material.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 96 MAINTENANCE – AIRCRAFT/SPARES STORAGE (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21196-1 **GENERAL.** Storage facilities for miscellaneous aircraft equipment/parts/goods, etc., will be provided only where it can be individually justified. In addition to the method of determining the gross square-footage requirement, the justification should include an explanation as to why the storage requirement cannot be met through storage space provided within hangars/shops or 440 series covered general supply facilities. No specific criteria are available for this type of facility; however, general information on normal stacking heights, SF per measurement ton, and other warehousing parameters are provided in Category Code 440 series.

211 97 PLANT SERVICES AND AIRCRAFT OVERHAUL (NAVAIR DEPOT)  
(m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21197-1 **GENERAL.** A Plant Services and Aircraft Overhaul Facility is required to provide space which is used in providing general support to all aircraft production

operations. General support includes functions such as management, supervision, engineering, clerical functions, plant maintenance, central or general storage, quality assurance, and materials testing. This Category Code includes offices, cafeterias, supervisors' work space, shop parts storage areas, dispatching facilities, inspection facilities, stairwells, auxiliary equipment rooms, walls, etc.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 98 AIRCRAFT ACOUSTICAL ENCLOSURE (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 2116**

**BFR Required: Y**

21198-1 **GENERAL.** An Aircraft Acoustical Enclosure is required to provide a covered facility for the in-frame aircraft engine run-up maintenance and testing performed by NAVAIR Depot. The aircraft acoustical enclosure, sometimes referred to as a hush house, is a total enclosure for fixed wing aircraft designed to abate noise during in-frame run-up of jet engines. The facility consists of a hangar-like aircraft enclosure, an absorptive augments for inducing cooling air and absorbing noise, a 45-degree blast deflector, an observation room with lavatory, and a mechanical equipment room. The observation and mechanical rooms are located adjacent to, not within, the aircraft enclosure.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

211 99 HAZARDOUS MATERIAL STOREHOUSE (NAVAIR DEPOT) (m<sup>2</sup> / SF)

**FAC: 4413**

**BFR Required: Y**

21199-1 **GENERAL.** A Hazardous Material Storehouse for Naval Air Depot (NAVAIR Depot) is required to provide space for the storage of hazardous substances and materials.

There are no specific criteria developed for this Category Code. An engineering study must be performed to determine requirement.

## 211 SUPPLEMENT – MARINE CORPS AIRCRAFT MAINTENANCE FACILITIES

### 211-1 GENERAL

Facilities for the maintenance and repair of Navy and Marine Corps aircraft and related spares, including airframes, aircraft engines, aircraft weapons systems, avionics systems, and other related aircraft equipment are planned in accordance with maintenance functions and levels as authorized by the Chief of Naval Operations (CNO). Maintenance classifications are defined in OPNAVINST 4790.2 (series) and are the basis for the Naval Aircraft Maintenance Program (NAMP). Within the Marine Corps, the Deputy Commandant for Aviation (DC/A) is responsible for planning and coordinating staff activities for all matters relative to organization, equipment, manpower, training, and support of Marine Corps aviation units and installations, including all Aviation Logistics (AVLOG) matters. Because Marine Corps aviation is an integral part of naval aviation, DC/A is responsible to the CNO to ensure that Marine Corps aviation is in consonance with the overall Naval Aviation Program.

OPNAVINST 4790.2 (series) supports CNO/Commandant of the Marine Corps (CMC) readiness and safety objectives, and provides for optimum use of manpower, facilities, materiel, and funds. The NAMP is founded upon three-level maintenance concept: depot (“D” level) maintenance, intermediate “I” level maintenance and organizational (“O” level) maintenance. It is the authority governing management of D-level, I-level, and O-level aviation and aeronautical equipment maintenance. It provides the management tools required for efficient and economical use of personnel and material resources in performing maintenance. It also provides the basis for establishing standard organizations, procedures, and responsibilities for accomplishing all maintenance on naval aircraft, associated materiel, and equipment. The division of maintenance into the three levels allows management to:

- i. Classify maintenance functions by levels.
- ii. Assign responsibility for maintenance functions to a specific level.
- iii. Assign maintenance tasks consistent with the complexity, depth, scope, and range of work to be performed.
- iv. Accomplish any particular maintenance task or support service at a level that ensures optimum economic use of resources.
- v. Collect, analyze, and use data to assist all levels of NAMP management.



## 211-2 DEPOT LEVEL MAINTENANCE

D-level maintenance is performed at naval aviation industrial establishments to ensure continued flying integrity of airframes and flight systems during subsequent operational service periods. D-level maintenance is also performed on material requiring major overhaul or rebuilding of parts, assemblies, subassemblies, and end items. It includes manufacturing parts, modifying, testing, inspecting, sampling, and reclamation. D-level maintenance supports O-level and I-level maintenance by providing engineering assistance and performing maintenance beyond their capabilities. D-level maintenance functions are grouped as follows:

- i. Standard D-level maintenance of aircraft.
- ii. Rework and repair of engines, components, and support equipment.
- iii. Calibration by Navy calibration laboratories.
- iv. Incorporation of technical directives (TDs).
- v. Modification of aircraft, engines, and support equipment.
- vi. Manufacture or modification of parts or kits.
- vii. Technical and engineering assistance by field teams.
- viii. Aircraft armament or aircraft and equipment under reliability-centered maintenance (RCM).
- ix. Rework of expeditionary airfield (EAF) components.

## 211-3. D-LEVEL MAINTENANCE CATEGORY CODES AND REQUIREMENT

Facilities that are generally categorized as D-level maintenance facilities (also noted as NAVAIR depot) are shown in Table 211-5 “D” Level Maintenance Facilities” and described in Section 211-1.10 “Facilities Categorized as “D” Level Maintenance” of the introduction to this category code series, “Series 211 Maintenance – Aircraft, Spares”. Each requirement for depot maintenance facilities must be planned and justified individually.

## 211-4 ORGANIZATIONAL LEVEL MAINTENANCE

O-level maintenance is performed by operating units (squadrons) on a day-to-day basis in support of their operations. The O-level maintenance mission is to maintain assigned aircraft and aeronautical equipment in a full mission-capable status while continuing to

improve the local maintenance process. While O-level maintenance may be done by I-level or D-level activities, O-level maintenance is usually accomplished by maintenance personnel assigned to aircraft squadrons. Generally, O-level maintenance can be grouped under the following categories:

- i. Inspections.
- ii. Servicing.
- iii. Handling.
- iv. On-equipment corrective and preventative maintenance, including repair, removal, and replacement of defective components.
- v. Class V (A) ordnance loading/unloading and arming/dearming.
- vi. Incorporation of TDs
- vii. Recordkeeping and reports preparation.
- viii. Age exploration or aircraft and equipment under RCM.

211-4.1 **O-level Maintenance Category Codes.** Facilities that are generally categorized as O-level maintenance facilities are shown in Table 21100-2 “O” Level Maintenance Facilities” and described in Section 211-1 “Facilities Categorized as “O” Level Maintenance” of the introduction to this category code series, “Series 211 Maintenance – Aircraft, Spares”. Marine Corps requirements for organizational level aircraft maintenance facilities are computed in the same manner as Navy requirements. See Category Codes 211 03, 211 04, 211 05, 211 06, and 211 07 for individual computation methodologies.

## 211-5 INTERMEDIATE LEVEL MAINTENANCE

Marine Corps air installations may be assigned limited intermediate maintenance level responsibilities for its own aircraft; however, most I-level aircraft maintenance is performed by a Marine Air Logistics Squadron (MALS). The I-level maintenance mission is to enhance and sustain the combat readiness and mission capability of supported activities by providing quality and timely material support at the nearest location with the lowest practical resource expenditure. I-level maintenance consists of on-and off-equipment materiel support and may be grouped as follows:

- i. Performance of maintenance on aeronautical components and related support equipment and EAF components.

- ii. Calibration of designated equipment.
- iii. Processing aircraft components from stricken aircraft.
- iv. Providing technical assistance to supported units.
- v. Incorporation of TDs.
- vi. Manufacture of selected aeronautical components, liquids, and gases (cryogenics).
- vi. Performance of on-aircraft maintenance when required.
- vii. Age exploration of aircraft and equipment under RCM.
- viii. Weapons preparation.

#### 211-6 MARINE AIR LOGISTICS SQUADRON

MALS was developed by the Marine Corps to enhance the aviation unit's transition from a garrison configuration to the composite Aviation Combat Element (ACE) of a Marine Air Ground Task Force (MAGTF).

The composition and size of a MAGTF may vary, but the organizational structure will always be composed of four elements. These elements consist of the Command Element (CE), the Ground Combat Element (GCE), the Aviation Combat Element (ACE), and the Combat Service Support Element (CSSE). The composition and size of the MAGTF is structured to achieve the missions required to meet the existing world threats. The MAGTF may be employed in three sizes: a Marine Expeditionary Unit (MEU), a Marine Expeditionary Brigade (MEB), and a Marine Expeditionary Force (MEF). The composition of the ACE is task-organized to conduct tactical air operations to support each of these MAGTF elements.

211-6.1 **MALS Organization.** The MALS is a command entity emulating the organizational structure of other Marine squadrons. A typical MALS is composed of the following Departments:

- 1) MALS Maintenance Department
- 2) Aviation Supply Department (ASD)
- 3) MALS Operations Department
- 4) Aviation Information Systems Department

211-6.1.1 **MALS Maintenance Department.** The Aviation Logistics functions of the MALS maintenance department include aircraft, avionics, support equipment maintenance, flight equipment, cryogenics, aviation

ordnance, and maintenance data collection and analysis. All available talents and resources are used to ensure components are repaired to the highest standard of quality to further enhance the warfighting capabilities of the customer (the tactical squadrons). Specific responsibilities are as follows:

- Coordinate control of aircraft maintenance performed by, and in support of, squadrons and units under the cognizance of the MAG Commanding Officer, and materiel condition and combat readiness of assigned weapons systems and equipment.
- Conduct liaison among squadrons, stations, MAWs, and other activities in connection with maintenance or materiel matters.
- Ensure squadrons within the MAG provide augmentation personnel on a temporary additional duty basis as required for training in the maintenance of organic systems and subsystems by the I-level.
- Coordinate pre-deployment planning for the provisioning of personnel, facilities, support equipment, and services for supported squadrons.
- Screen supported deploying squadron materiel to ensure only materiel considered essential to support the specific deployment is embarked, and consolidation of multiple squadron requirements is made whenever possible.
- Screen appropriate Marine Aviation Logistics Support Program (MALSP) individual material readiness list (IMRL) allowances to ensure they are tailored to support the quantity and type aircraft assigned to the MAG squadrons.
- Ensure the MAG aircraft assignment board (or equivalent) is maintained and reflects current status.
- Maintain liaison with supported squadron maintenance material control centers and the ASD, and ensure adequate validation and reconciliation of outstanding requirements takes place.
- Monitor MAG squadrons to ensure an effective maintenance program is being conducted.
- Monitor MAG squadrons to ensure an active and effective quality assurance monitoring program exists.

- Monitor MAG squadrons to ensure correct maintenance, administration, and material handling procedures are used, directing particular attention to the detection and removal of all administrative impediments to aircraft readiness.
- Assist squadrons in obtaining engineering technical assistance.
- Coordinate with other staff organizations to ensure maintenance facility requirements for both MALS and O-level are updated and submitted as required.
- Coordinate the assignment of aircraft parking spaces within the MAG.
- Ensure an aggressive and effective management program is in place to control cannibalization of aeronautical equipment. To the maximum extent possible, ensure selective cannibalization actions are planned to prevent aircraft from being in a non-flyable status for more than 30 consecutive days.
- Ensure inter-MALS liaison is maintained for repair of components in the secondary repair site program.
- Coordinate D-level drive-in or field modifications of assigned aircraft.
- Ensure an effective program is in place to perform a quarterly review of the MALS individual component repair list.
- Conduct regular meetings, chaired by the maintenance officer and co-chaired by the Aviation Supply Officer, with supported units to ensure optimum communication and coordination.
- Analyze the mission accomplishment and capabilities of the department using reports provided by the maintenance data system (MDS) on a continuing basis.

Within the MALS Maintenance Department there are two divisions:

- a) Avionics Division
- b) Aviation Ordnance Division

**a) Avionics Division.** The avionics division provides maximum support, coordination, and leadership to the MALS' mission in the areas of aircraft maintenance, avionics equipment maintenance, integrated logistics resource management, and professional personnel development.

All maintenance and support of the MALS and supporting activities, avionics equipment – to include weapons repairable assemblies, shop repairable assemblies, support equipment, test measuring and diagnostic equipment, and “Navy funded” computers and peripherals – will be performed by personnel assigned within the avionics division. These functions encompass programs, equipment, and support for activities both internal and occasionally external to the MAG. The avionics division, responsible to the maintenance officer, has the overall responsibility for the production effort within the MALS, on matters dealing with the scheduling, prioritization, and production of avionics equipment.

An avionics division exists within each MALS and consists of the following functional branches: avionics branch, precision measurement equipment branch, and various production branches necessary to support flying squadrons of the MAG. Each branch is responsible for the maintenance of its avionics equipment, the welfare of its personnel, an accurate accountability of work center IMRL assets, and individual branch security. The avionics branch is responsible for overall division administrative duties and I-level maintenance on avionics equipment. Depending on the type of aircraft supported, the avionics branch may contain up to five work centers: communications/navigation, electrical/instrument repair, automatic test equipment, electronic warfare, and radar.

**b) Aviation Ordnance Division.** The function of the aviation ordnance division is to provide the MALS with logistical and management support of class V(A) ordnance, aircraft armament equipment (AAE), and armament weapons support equipment (AWSE). This is done by interpreting and implementing the ordnance policies and procedures for the MAG. The MALS ordnance staff:

- Ensures the management and distribution of authorized noncombat expenditure allocation (NCEA).
- Assists the MAG in developing testing and training requirements for aviation ordnance.
- Ensures proper logistical support and storage requirements for prepositioned ware reserve materiel requirements assets are identified, including buildup and delivery of class V(A), ammunition stock points, advanced bases, and forward arming and refueling points.
- Manages the MAG’s ordnance safety program and ensures explosive safety policies and procedures are issued as required.

- Ensures compliance with the policies and procedures set forth in OPNAVINST 8000.16A, "Naval Ordnance Maintenance Management Program (NOMMP)", when preparing quality deficiency reports, explosive mishap reports, technical publication deficiency reports, and engineering investigation requests.
- Ensures class V(A) materiel is managed per the current revision of NAVSUP P-724, "Conventional Ordnance Stockpile Management Policies and Procedures Manual", and other related directives.
- Establishes and monitors the handling, qualification, and certification program for nonnuclear aviation ordnance and nonnuclear explosive devices for the MALS.
- Establishes and maintains a satellite production control work center.
- Analyzes division production and readiness using reports provided by the MDS.
- Ensures satellite production efforts support the maintenance department's goals, objectives, and standards.
- Publishes a monthly maintenance and training plan for airborne weapons, training assets, AWSE, AAE, and formal in-Service training of aviation ordnance personnel.
- Ensures all maintenance performed on the AAE pool and AWSE is per the standards and guidelines established by the MALS maintenance department.
- Provides information on manpower, equipment, class V(A) materiel, and facilities to appropriate authorities.
- Establishes a verification program for technical manuals and directives maintained by the division.
- Establishes an AAE pool per MAW and aircraft controlling custodian/type commander (TYCOM) directives.
- Ensures the Retail Ordnance Logistics Management System (ROLMS) and the standardized conventional ammunition automated inventory record are used to manage class V (A).
- Monitors and coordinates nonexpendable aviation ordnance support provided by the MALSP.

- Ensures the division maintains the capability to operate from advanced bases and forward arming and refueling points.
- Coordinates pre-deployment planning for ordnance personnel, facilities, support equipment, ordnance materiel, and services to support squadrons (NAVSEA OP-5 Vol III, "Ammunition and Explosives Ashore, Advance Bases").
- Screens squadron materiel requests and the availability of class V (A) assets to insure only materiel considered essential is embarked.
- Ensures appropriate levels of support are identified in the time-phased force and deployment data (TPFDD) database.

211-6.1.2 **Aviation Supply Department (ASD).** The ASD executes all functions dealing with the inventory, storage, and management of Navy-provided materiel. The ASD staff functions include, but are not limited to, the direct responsibilities listed in the following paragraphs. An ASD exists within each MALS with physical location of the divisions within the ASD varying depending upon local situations. However, preferred locations are adjacent to the maintenance department production divisions. The hours of operation will be consistent with the operating hours of supported organizations.

Within the ASD there are seven divisions:

- a) Supply Response Division
- b) Consumables Management Division
- c) Repairables Management Division
- d) Supply Accounting Division
- e) Squadron Support Division
- f) Supply Management Division
- g) Supply Personnel and Administration Division

**a) Supply Response Division.** The supply response division is responsible for the initial screening and technical research of all requisitions assigned by Naval Aviation Logistics Command Management Information System (NALCOMIS). The supply response division will refer consumable requisitions that cannot be filled from supply officer stores to the appropriate supply point of entry. The supply response division is also responsible for the reconciliation and monitoring of all outstanding direct turn-over (DTO) requisitions except for custodial, pre-expended bins, and service market items.



**b) Consumables Management Division.** The consumables management division is responsible for the procurement, receipt, storage, issue, delivery, and inventory of all consumable material.

The consumables management division consists of the following five branches:

- i. Receiving Branch
- ii. Consumable Delivery Branch
- iii. Consumables Storage Branch
- iv. Consumable Control Branch
- v. Pre-Expended Branch

**i. Receiving Branch.** The receiving branch receipts and redistributes all material shipped to the MAG/MALS from external sources.

**ii. Consumable Delivery Branch.** The consumable delivery branch delivers all consumable issues, consumable DTO receipts, and processes related transactions.

**iii. Consumables Storage Branch.** The consumables storage branch stores, issues, and inventories all consumable material in the supply officer's stores and is divided into the consumable storage section and the consumable issue section.

**iv. Consumable Control Branch.** The consumable control branch manages inventory of consumable material.

**v. Pre-Expended Branch.** The pre-expended branch establishes, manages, and replenishes pre-expended bin sites authorized by the AVNSUPO or maintenance officer.

**c) Repairables Management Division.** The repairables management division is responsible for:

- Repairables allowance management, procurement, receipt, storage, issue, delivery, and inventory of all repairable materiel.
- Induction and recovery of repairables into/from the Intermediate Maintenance Activity "abd" for shipment and tracking beyond-the-capability-of-maintenance components to the appropriate activity.
- Management and control of all classified and fleet controlled materiel (repairable and consumable).

The repairables management division consists of the following five branches:

- i. Repairables Control Branch
- ii. Repairables Delivery Branch
- iii. Repairables Storage Branch
- iv. Awaiting Parts Branch
- v. Supply Shipping Branch

**i. Repairables Control Branch.** The repairables control branch:

- establishes and maintains repairable allowances and is responsible for their procurement, inventory, and accountability.
- processes repairable requisitions and receipts with exceptions, and all repairables returned from the Intermediate Maintenance Activity.
- screens and tracks carcasses that are beyond-the-capability-of-maintenance.
- performs all duties on classified material (receipt, storage, issue, packaging, and shipment). Procedures for handling classified material are in Secretary of the Navy Instruction (SECNAVINST) 5510.36, "DON Information Security Program Regulation", and OPNAVINST 5218.7B, "Navy Official Mail Management Instructions".

**ii. Repairables Delivery Branch.** The repairables delivery branch delivers all repairable materiel (issues and DTO) to the customer. It also picks up all non-ready for issue repairable components from the customer ensuring accuracy of all documents, i.e., logbook, scheduled removal card, and maintenance action form (MAF).

**iii. Repairables Storage Branch.** The repairables storage branch is responsible for the receipt, issue, storage, and inventory of all repairable materiel in the supply officer's store. The storage of repairables is broken down into two separate sections – weapons repairable assembly and shop repairable assembly.

**iv. Awaiting Parts Branch.** The awaiting parts branch stores and manages repairable components awaiting repair parts.

v. **Supply Shipping Branch.** The supply shipping branch packages and ships all aeronautical-related components and equipment.

d) **Supply Accounting Division.** The supply accounting division is responsible for all tasks related to maintaining and reporting the financial accounts granted to the ASD.

The supply accounting division consists of the following two branches:

- i. End Use Branch
- ii. Stock Fund Branch

i. **End Use Branch.** The end use branch maintains and reports all end use accounts allocated to the ASD, and is divided by operating target (OPTAR) funding.

ii. **Stock Fund Branch.** The stock fund branch reports transactions, which affect the Navy Working Capital Fund (NWCF) special accounting class (SAC) 207 inventory. It also verifies the financial processing of all transactions processed by the MAL5.

e) **Squadron Support Division.** The squadron support division is responsible for receiving, processing, and monitoring all requirements for aeronautical-related custodial materiel and maintaining custody records for all organizational allowances.

The squadron support division consists of the following two branches:

- i. Customer Assistance Branch
- ii. Custody Records Branch

i. **Customer Assistance Branch.** The customer assistance branch receives, processes, and monitors all requirements for aeronautical-related custodial materiel.

ii. **Custody Records Branch.** The custody records branch maintains the custody record cards for all organizational allowance material, such as IMRL, TBA, COSAL, controlled equipment listed in the NAVAIR 00-35QH-2 (Section H), and maintenance assist modules/test bench installations. This branch also formulates the quarterly and annual budgets and the mid-year budget review for all custodial materiel.

**f) Supply Management Division.** The supply management division is composed of the most knowledgeable and experienced aviation supply personnel responsible for monitoring the overall supply department operation, technical training, and MALSP allowances and pickups (as they pertain to deployed and contingency operations).

The supply management division consists of the following two branches:

- i. Audit Branch
- ii. MALSP Support Branch

**i. Audit Branch.** The audit branch monitors all supply functions within the ASD to ensure compliance with authorized procedures and achievement of established goals.

**ii. MALSP Support Branch.** The MALSP support branch validates and loads MALSP allowances and monitors pickups.

**g) Supply Personnel and Administration Division.** The supply personnel and administration division is responsible for the administrative control of all personnel assigned. The supply personnel and administration division performs clerical functions and maintains the master files of all messages, orders, correspondence, and directives for the ASD.

The supply personnel and administration division consists of the following two branches:

- i. Supply Personnel Branch
- ii. Supply Administrative Branch

**i. Supply Personnel Branch.** The supply personnel branch performs functions related to administrative control of all personnel within the ASD.

**ii. Supply Administrative Branch.** The supply administrative branch provides clerical assistance for the ASD as directed by the AVNSUPO or the aviation supply chief.

**211-6.1.3 MALS Operations Department.** The MALS is a command entity similar to other Marine squadrons. The MALS operations officer is the chief advisor to the MALS Commanding Officer for all matters pertaining to planning and execution of tactical operations involving aviation logistical support (ALS). The MALS operations department

identifies, plans, coordinates, and supervises all operational AVLOG planning requirements.

The MALS operations department coordinates with both the parent MAG and each supported squadron regarding ALS for deployed squadrons and detachments. It also serves as the MALS point of contact for all deployment support involving the unit deployment program, L-Class/aircraft carrier (CV)/aircraft carrier (nuclear) (CVN) and aviation logistics support ships (T-AVB)/maritime pre-positioning force (MPF) employment plans and milestone reporting. It is also responsible for AVLOG force deployment planning and execution (FDP&E) as it relates to deliberate and crisis action planning (CAP).

**211-6.1.3.1 Deliberate Planning.** Deliberate planning is conducted during peacetime to develop and refine war plans. Planning in this fashion allows for orderly and methodical command and staff participation in the preparation of a plan. Deliberate planning is conducted when there is ample time for detailed, methodical, and comprehensive planning and coordination. The deliberate planning process culminates with the creation and refinement of time-phased force and deployment data (TPFDD) and its placement into the Joint Operation Planning and Execution System (JOPES). The following steps will be followed during the deliberate planning process. The MALS operations department:

- Coordinates the range and depth of AVLOG support required to support the concept of operations as defined by the MAW AVLOG plans section.
- Reviews all plans that require employment of AVLOG and class V(A) support and coordinates operational AVLOG as required to support each plan.
- Coordinates the review of operational and contingency plans (OPLANs/CONPLANS) with internal MALS department.
- Determines, in coordination with consolidated administration, assignment of MALS core and augments personnel to:
  - Maritime prepositioning ship (MPS) survey, liaison, and reconnaissance party, arrival and assembly operations element, and offload preparation party.
- T-AVB.

- CV/CVN/general purpose amphibious assault ship (LHA)/multi-purpose amphibious assault ship (LHD).
- Ashore ACE bed-down airfield.

The MALS operations department also reviews each applicable deliberate plan and determines:

- If the commander's intent and end state for each deliberate plan/CONPLAN have been met.
- The employment, configuration, and coordination of arrival date of the T-AVB.
- The TPFDD for of AVLOG assets into the theater of operations.
- Each MALS unit line number is identified on the TPFDD.
- Site survey for the MALS bed-down sites.
- Geo-prepositioning support equipment offload distribution and assignment plan.

**211-6.1.3.2 Crisis Action Planning.** CAP performed by AVLOG planners at all levels must recognize that CAP is not governed by rigid steps as it is a flexible means of coordinating staff action. However, certain conditions may be viewed as probable with respect to the preparation of deployment data in response to any crisis action situation. If the crisis is in response to a contingency for which deliberate planning has been conducted, the existing planning data can be used as a tool to develop tailored support. If the crisis is in response to a contingency for which no deliberate planning has been previously conducted, ALS must be tailored without the benefit of existing data. During CAP, the MALS operations department is responsible for:

- Recommending to the MALS CO operational priorities for the movement of MALS support.
- Acting as the MALS point of contact for the wing staff when the CAP is established.
- Coordinating the development and implementation of troop movements from home station to the sea/airport of embarkation.

- Coordinating with other MALS departments/sections to identify and tailor ALS.
- Determining priorities for MALS replacements in coordination with the S-1.
- Coordinating MALS operations security and signal security.

211-6.1.4 **Aviation Information Systems Department.** The Aviation Information Systems Department (AISD) provides data processing support to the supply and maintenance departments. The AISD is responsible for the administration, operation, and maintenance of all computer systems and networks throughout the supply, maintenance, and ordnance departments.

Within the AISD there are five divisions:

- a) Administration Division
- b) Customer Support Division
- c) Network Administration Division
- d) Systems Processing Division
- e) Maintenance Support Division

**a) Administration Division.** The administration division is responsible for the administrative control of all personnel assigned. Personnel within the division perform clerical functions and maintain the master files for messages, orders, correspondence, and directives for the AISD.

**b) Customer Support Division.** The customer support division is the primary manager for customer support within the AISD. Unit/department representatives will forward discrepancies that cannot be resolved locally to the customer support division, who will then initiate the discrepancy into the maintenance cycle. The customer support division will further operate as the department issue and receive desk, production control/help desk call center, AISD asset manager, and supply/maintenance liaison, providing monitored support to the MAG relative to aviation information systems. In addition, the customer support division will substantiate and prioritize AISD requirements submitted via the supply department.

**c) Network Administration Division.** The network administration division is responsible for the management of all automated information systems (AIS) network resources within the MAG. These responsibilities include managing and upgrading network operating systems, data assurance, user account management, network architecture

documentation and upgrade planning, network security, workstation software standardization.

**d) Systems Processing Division.** The systems processing division provides data processing support to the supply and maintenance departments. The systems processing division is responsible for administrative and operational control of the Intermediate Maintenance Activity Naval Tactical Command Support System (NTCSS) systems. The systems processing division is also responsible for coordination of application workload and output to the supply applications administrator and the maintenance applications manager.

**e) Maintenance Support Division.** The maintenance support division consists of AISD technicians that provide direct maintenance and installation support for all AIS and MALS core network assets.

#### **Marine Corps Intermediate Maintenance Requirements Example Calculation:**

Because of the expeditionary nature of the Marine Corps air support mission, many of the aircraft intermediate level maintenance shops are located in deployable mobile facilities (MFs). For this reason, Marine Corps aircraft intermediate level maintenance facilities in the continental United States are a combination of permanent facilities and mobile vans while Navy aircraft intermediate maintenance facilities are all permanent facilities.

The MFs (generally 2.4 m x 2.4 m x 6.1 m (8 ft x 8 ft x 20 ft) vans) used by the MALS conform to International Organization of Standardization container dimensions and are configured to perform a multitude of missions. MFs require a concrete pad and utility support when at home base. This allows the MFs to be used, maintained, and always ready to deploy for their primary mission. See Category Code 116 65, Mobile Facility Support Pad for concrete pad and utility support requirements.

When at home base, MFs are used primarily for training. It is also crucial to keep the MFs in good working order in case of rapid deployment need. If MFs are utilized at the home base, they should not reduce the various intermediate maintenance shop requirements.

Marine Corps aircraft intermediate level maintenance facilities are planned utilizing the basic criteria for comparable Navy facilities except that it is necessary to:

- a. Provide one Type I hangar module for each Marine Air Logistics Squadron (MALS) assigned to an installation. This hangar supports the intermediate level maintenance program and is in addition to hangars required for organizational maintenance.



- b. Size intermediate level maintenance shops in the same manner as Navy requirements.
- c. Plan airframes shop requirements as part of the MALS hangar 01 space, and this space should be categorized as 211 06 rather than 211 08.

The following is an example of how to determine the amount of permanent intermediate level maintenance shop space required for a MALS (in addition to one Type I hangar), with the gross requirements for each shop being computed utilizing the appropriate criteria.

Example: Taking a MALS which supports a group composed of 4 VMA squadrons composed of 20 AV-8B aircraft each, 2 VMAQ squadrons composed of 8 EA-6B aircraft each, and 2 VMGR squadrons composed of 7 KC-130 aircraft each. Additionally, the MALS has 10 AM32K-4 and 10 MHU-151/M armament trailers. The MALS has mobile facilities and the air station has 60 fixed point utility stations. Intermediate level maintenance shop space requirements are computed for each basic shop. In this example, airframes, avionics, aviation armament, aviation life support systems, and ground support equipment shops are computed. Hangar space requirements for organizational maintenance are computed utilizing the same criteria as for Navy hangars. See Aircraft Maintenance Hangar, Category Codes 211 05, 211 06, and 211 07. In addition, one Type I maintenance hangar is required for the MALS.

Step 1: Select the appropriate intermediate level shop Category Codes:

- i. Airframes Shop: Category Code 211 08
- ii. Aircraft Intermediate Maintenance Activity Management: Category Code 211 16
- iii. Engine Maintenance Shop: Category Code 211 21
- iv. Avionics Shop: Category Code 211 45
- v. Aviation Armament Shop: Category Code 211 54
- vi. Aviation Life Support Systems Shop: Category Code 211 75
- vii. Ground Support Equipment Shop: Category Code 218 60
- viii. Ground Support Equipment Shed: Category Code 218 61

Step 2: Airframes Shop (211 08)

a.) Using computation methodology for Category Code 211 08:

Type of Aircraft	Number of Aircraft
AV-8B	80
EA-6B	16
KC-130	14
Total	110

In accordance with Table 21108-2, a total of 110 aircraft requires a basic area of 1,571 m<sup>2</sup> (16,900 SF). Using Table 21108-3, it is determined the Composite Shop required for

AV-8B support adds an additional 151 m<sup>2</sup> (1,630 SF). This gives a gross area as follows:

Airframes Shop Summary:

Component	m <sup>2</sup>	SF
Basic Area	1,571	16,900
Composite Shop	151	1,630
Gross Airframes Shop Area	1,722	18,530

The Airframes Shop shall be located in the Type I hangar configured for the MALS.

Step 3: Aircraft Intermediate Maintenance Activity Management (211 16)

a.) Using computation methodology for Category Code 211 16:

The management spaces provide for the control, monitoring, and administration of the Intermediate Maintenance Activity (IMA). The Aircraft Maintenance Officer and staff are responsible for the administration and supervision of the maintenance effort for the IMA. These responsibilities include production control, material control, financial accounting, training, personnel, administration, quality control, technical publications library, data analysis, and tool control for common and special tools and test equipment. The Naval Aeronautical Engineering Services Unit (NAESU) staff and personnel performing In-Service Engineering Agent (ISEA) functions for aircraft are often collocated in these same spaces.

Provide 917 m<sup>2</sup> (9,875 SF) for IMA management functions.

Step 4: Engine Maintenance Shop (211 21):

a.) Using computation methodology for Category Code 211 21:

Type of Aircraft	Number of Aircraft
AV-8B	80
EA-6B	16
KC-130	14

Using Table 21121-2:

Aircraft		Area	
No.	Type	m <sup>2</sup>	SF
80	AV-8B	1,820	19,575
16	EA-6B	239	2,575

Aircraft		Area	
14	KC-130	332	3,575
Subtotal		2,391	25,725

Using Table 21121-3:

Additional Space Requirement based on total space allowance computed using Table 21121-2.

Computed Space Allowance (from table 21121-2)	Square Meters (from Table 21121-3)	Square Feet (from Table 21121-3)	Percent Factor (from Table 21121-3)
2,391 m <sup>2</sup> 25,725 SF	2,324 – 2,556	25,001 – 27,500	45%

$$2,391 \text{ m}^2 \times 45\% = 1,076 \text{ m}^2 \text{ or } 25,725 \text{ SF} \times 45\% = 11,576 \text{ SF}$$

High Bay Area (Subtotal from Table 21121-2): 2,931 m<sup>2</sup> (25,725 SF)

Shop Wing/Mezzanine (Subtotal from Table 21121-3): 1,076 m<sup>2</sup> (11,576 SF)

$$\begin{aligned} \text{Total Engine Maintenance Shop} &= (2,931 + 1,076) \text{ m}^2 = 4,007 \text{ m}^2 \\ &= (25,725 + 11,576) \text{ SF} = 37,301 \text{ SF} \end{aligned}$$

If authorized by higher authority, additional applicable work center space requirements from Table 21121-4 shall be added.

Using table 21121-4:

Work Center	AV-8B	6B	EA-	KC-130	M2	SF
Propeller				X	272	3,375
Auxiliary Power Unit	X			X	167	1,800
Rotor Dynamics					0	0
Auxiliary Fuel Stores			X		314	3,375
Total					753	8,550

Note: Only one work center of each type required.

Step 5: Avionics Shop (211 45)

a.) Using computation methodology for Category Code 211 45:

Obtain the basic space requirements for all type/model aircraft by entering Table 21145-1 with quantity of aircraft to be supported. Select the lowest percentage factor for secondary type aircraft for Column (3) by crossing from that aircraft in secondary column and considering each aircraft assigned with a larger basic space requirement as a prime aircraft.

- i. The AV-8B has only the EA-6B with a larger basic space requirement therefore 42% will be used in Column (3).
- ii. The KC-130 has both the AV-8B (33%) and the EA-6B (36%) with larger basic requirements. The AV-8B has the lowest percentage factor (33%) so this will be entered in Column (3).
- iii. The EA-6B aircraft has the largest basic space requirement, therefore it is the prime aircraft with a percentage factor of 100% entered in Column (3).

Column (1)	Column (2) (Table 21145-1)		Column (3) (Table 21145-2)	Column (4) [Col(2) x Col(3)]	
	m <sup>2</sup>	SF		m <sup>2</sup>	SF
80 AV-8B	1,766	19,000	0.42	742	7,980
16 EA-6B	2,342	25,200	1.00	2,342	25,200
14 KC-130	1,171	12,600	0.33	386	4,158
Gross Avionics Shop Area				3,470	37,338

Step 6: Aviation Armament Shop (211 54)

a.) Using computation methodology for Category Code 211 54:

Type of Aircraft	Number of Aircraft	Trailer Type	Number of Trailers
AV-8B	80	AM32K-4A	10
EA-6B	16	MHU-151/M	10
KC-130	14	Total	20
Total	110		

i. Basic Shop Requirement

Determine the Aircraft Classification by entering Table 21154-1.

AV-8B: Attack/Fighter  
 EA-6B: Attack/Fighter  
 KC-130: Not Applicable

Obtain the basic space allowance by entering Table 21154-2. For a total of 96 Attack/Fighter Aircraft the basic space allowance is 465 m<sup>2</sup> (5,000 SF).

ii. Aviation Armament Equipment Pool Requirement

Column (1) Type A/C	Column (2) Area per A/C		Number of A/C	Pool Support Space	
	m <sup>2</sup>	SF		m <sup>2</sup>	SF
AV-8B	3.5	38	80	280	3,040
EA-6B	7.3	78	16	117	1,248
KC-130	N/A	N/A	14	0	0
Total Equipment Pool Support Space				397	4,288

iii. Armament Weapons Support Equipment Work Center (Marine Corps requirement ONLY)

Column (1) Type Trailer	Column (2) Area per Trailer		Number of Trailers	Area for Trailers	
	m <sup>2</sup>	SF		m <sup>2</sup>	SF
AM32K-A4	2.3	25	10	23	250
MHU-151/M	1.4	15	10	14	150
Total Equipment Pool Support Space				37	400

Aviation Armament Shop Summary:

Area	m <sup>2</sup>	SF
Basic Shop	465	5,000
Aviation Armament Equipment Pool	397	4,288
Armament Weapons Support Equipment Work Center	37	400
Gross Aviation Armament Shop Area	899	9,688

Step 7: Aviation Life Support Systems Shop (211 75)

a.) Using computation methodology for Category Code 211 75:

Type of Aircraft	Number of Aircraft
AV-8B	80
EA-6B	16
KC-130	14
Total	110

Obtain the Parachute Shop Factor (Column (2)), Flotation Shop size (Column (3)), and Oxygen Shop size (Column (4)) for all type/model aircraft by entering Table 21175-1.

- i. The Parachute Shop Factor is 0.0016, the Flotation Shop size is M (46.5 m<sup>2</sup> (500 SF)), and the Oxygen Shop size is L (46.5 m<sup>2</sup> (500 SF)) for the AV-8B aircraft.
- ii. The Parachute Shop Factor is 0.0064, the Flotation Shop size is M (46.5 m<sup>2</sup> (500 SF)), and the Oxygen Shop size is L (46.5 m<sup>2</sup> (500 SF)) for the EA-6B aircraft.
- iii. The Parachute Shop Factor is 0.0064, the Flotation Shop size is L (83.7 m<sup>2</sup> (900 SF)), and the Oxygen Shop size is S (27.9 m<sup>2</sup> (300 SF)) for the AV-8B aircraft.

A/C Type	Number of A/C	Table 21175-1 Column (2)	Factor Product	Table 21175-1 Column (3)	Table 21175-1 Column (4)
AV-8B	80	0.0016	0.1280	M	L
EA-6B	16	0.0064	0.1024	M	L
KC-130	14	0.0064	0.0896	L	S
Total:			0.3200	L	L

From Table 21175-2, Basic Allowance for 0.3200 = 279 m<sup>2</sup> (3,000 SF)

From Table 21175-1, Column (3), Flotation Shop, "L"= 83.7 m<sup>2</sup> (900 SF)

From Table 21175-1, Column (4), Oxygen Shop, "L"= 46.5 m<sup>2</sup> (500 SF)

Total Aviation Life Support Systems Shop = 409.2 m<sup>2</sup> (4,400 SF)

Step 8: Ground Support Equipment Shop (218 60)

a.) Using computation methodology for Category Code 218 60:

Type of Aircraft	Number of Aircraft
AV-8B	80
EA-6B	16
KC-130	14
Total	110

b.) From Table 21860-1:

Component	Number of Aircraft	
	80 (up to 120)	
	m <sup>2</sup>	SF
Support Equipment Division/admin/ production control/tool room/ IMRL/ material control/SE pool	104	1,114
SE Training/License	28	300
Support	90	967
Net to gross (19%)	149	1,600
SE Gas Engine and Turbine Shop	28	300
SE Structural/Hydraulics Shop	74	800
SE Corrosion Control Shop	74	800
SE Electrical Repair Shop	28	300
SE Component Repair Shop	65	700
SE Periodic Maintenance Shop	63	680
Air Conditioning Repair Shop	-	-
SE Repair Lanes/Service Bays	229	2,460
Total Shop Area	931	10,021

c.) Shop Area size adjustment for existing Fixed Point Utility Stations (FPUS).

Number of apron parking spaces with FPUS = 60

60 apron spaces with FPUS multiplied by 1.0 m<sup>2</sup> (11.2 SF) = 60 m<sup>2</sup> (672 SF)

Reduce area by 60 m<sup>2</sup> (672 SF)

Total Ground Support Equipment Shop Area = (931 – 60) m<sup>2</sup> = 871 m<sup>2</sup>  
(10,021 – 672) SF = 9,349 SF

Step 9: Ground Support Equipment Shed (218 61)

a.) Using computation methodology for Category Code 218 61:

Type of Aircraft	Number of Aircraft
AV-8B	80
EA-6B	16
KC-130	14
Total	110

b.) From Table 21861-1:

No. of Aircraft	Shed Area	
	m <sup>2</sup>	SF
101-125	1,771	19,050

Total Ground Support Equipment Shed = 1,771 m<sup>2</sup>  
(19,050 SF)

In summary, the Intermediate Maintenance Shop space requirements for the MALS used for this example are:

1.	Airframes Shop	=	1,722 m <sup>2</sup>	18,530 SF
2.	IMA Management	=	917 m <sup>2</sup> .	9,875 SF
3.	Engine Maintenance Shop	=	4,007 m <sup>2</sup> .	37,301 SF
4.	Avionics Shop	=	3,470 m <sup>2</sup> .	37,338 SF
5.	Aviation Armament Shop	=	899 m <sup>2</sup>	9,688 SF
6.	Aviation Life Support Systems Shop	=	409 m <sup>2</sup> .	4,400 SF
7.	Ground Support Equipment Shop	=	871 m <sup>2</sup>	9,349 SF
8.	Ground Support Equipment Shed	=	1,771 m <sup>2</sup>	19,050 SF

In addition to the shop spaces listed above, one Type I hangar is required for support of the MALS. The hangar requirement is in addition to the hangar modules for organizational level maintenance as computed in Category Codes 211-05, 211-06, and 211-07.

See MIL-HDBK-1028/1C for definite drawings for Aviation Armament Shop, Aviation Life Support Systems Shop, and Avionics Shop.

## 212 MAINTENANCE - GUIDED MISSILES

212-1 This basic category provides facilities and shops for maintenance and repair of guided missile systems, ground handling, and launching equipment. Under certain circumstances, the maintenance and storage for these missiles are integrated and the missiles are maintained where they are stored.

212 10 GUIDED MISSILE INTEGRATION FACILITY (SF)

**FAC: 2121**

**BFR Required: Y**



21210-1 **DESCRIPTION.** The purpose of this facility is to assemble new-production components of air launched guided missiles and perform any required maintenance on fleet returned All-Up-Round (AUR) missiles or components. Missiles are returned from the fleet at service inspection time when the maintenance due date assigned to the missiles so require. This type of facility is primarily found at Naval Weapons Stations. However, it is also found at Naval Air Stations and other ordnance related activities.

21210-2 **REQUIREMENT.** A typical facility is capable of servicing four different types of missiles and is composed of six basic areas which are expressed in net square feet (NSF) as shown in Table 21210-1 below.

**Table 21210-1** Basic Areas of Guided Missile Integration Facility

Description of Basic Area	NSF
De-canning and Storage Area	3,050
Open Work Area and Support Maintenance	3,050
Assembly Area (Test Cell)	4,169
Missile Storage	1,229
Office/Library	1,160
Mechanical Equipment Room & Toilet	1,146
<b>Total</b>	<b>13,804</b>

21210-2.1 **Net to Gross Conversion.** The net to gross conversion factor for this facility is 1.24. Therefore, multiply the NSF times 1.24 to obtain the gross square feet (GSF) for the facility (i.e., 13,804 NSF x 1.24 = 17,117 GSF).

21210-2.2 **Facilities Servicing More Than Four Missile Types.** In the event that more than four types of missiles are required to be serviced, the size of the facility may be increased by 3,451 NSF or 4,280 GSF per additional type of missile.

21210-3 **Air Launched Missile Industrial Processing Guide (ALM-IPG).**

Additional information pertaining to the type of test performed and the amount of time required for each test involving the Sidewinder, Sparrow, Walleye, Shrike and Phoenix missile may be obtained from the ALM-IPG which is promulgated by Technical Manual Identification Number (TMIN) TW 800-AA-MMI-000/ALM - IPG.

21210-3.1 **Volumes in ALM-IPG.** The Guide consists of a general information volume and five additional volumes of data, each of which is dedicated to a particular missile. The Guide presently consists of the volumes shown in Table 21210-2.

**Table 21210-2. Volumes Contained in ALM-IPG**

Volume	Title	Technical Manual ID Number
1	General Information	TW 800-AA-MMI-010/ALM-IPG
2	SIDEWINDER AIM-9G/H/L	TW 800-AA-MMI-020-/ALM-IPG
3	SPARROW AIM-7E/F and RIM-7E/H	TW 800-AA-MMI-030/ALM-IPG
4	WALLEYE Guided Weapon	TW 800-AA-MMI-040/ALM-IPG
5	SHRIKE AGM-45A/B	TW 800-AA-MMI-050/ALM-IPG
6	PHOENIX AIM-54A	TW 800-AA-MMI-060/ALM-IPG

21210-3.2 **Ordering the ALM-IPG.** Copies of the Guide may be ordered from Code 2242 of the Pacific Missile Test Center, Point Mugu, CA, either as a complete set under TMIN-TW 800-AA- 000/ALM-IPG or as individual volumes using the individual volume Technical Manual Identification Number.

212 11 MISSILE MODULE MAINTENANCE AND LOADING FACILITY (SF)

**FAC: 2121**

**BFR Required: Y**

21211-1 **DESCRIPTION.** This facility will provide the Maintenance and Explosive Operation Location, EOL, for the Navy's new Missile Module Weapons Systems. The facility will be sited for Ordnance handling and provide maintenance/ordnance loading high bay, a tool room, parts room, pressurized wash system, MM elevated cleaning pit(s), Male/Female locker/shower rooms, overhead crane, and administrative support space.

21211-2 No planning factors are currently available for this facility. An engineering analysis is needed to determine facility space requirements.

212 20 MISSILE EQUIPMENT MAINTENANCE SHOP (SF)

**FAC: 2123**

**BFR Required: Y**

21220-1 No planning factors are currently available for this facility. Activities with a limited amount of missile-handling equipment should consider performing their maintenance in an Automotive Vehicle Maintenance Shop (Category Code 214 20).

212 30 MISSILE ASSEMBLY AND TEST BUILDING (SF)

**FAC: 2121**

**BFR Required: Y**

21230-1 **DESCRIPTION.** This facility is required for intermediate level maintenance of surface launched guided missiles. Component sections of the missile are tested, assembled into a missile of the required configuration, and tested as an all-up-round. Missiles may be received/shipped as bare missiles or packaged in containers.

21230-2 **REQUIREMENT.** Bridge cranes are needed to handle the missiles in the receiving/shipping area and onto the test beds in the test cells. Test cells should be constructed for an explosion hazard of 300 lbs net explosives weight. See Table 21230-1 for guidance on sizing the facility.

**Table 21230-1. Space Allowances for Surface Launched Guided Missiles**

<b>Weapons System</b>	<b>Gross SF</b>
<b>Standard</b>	
Assembly	9,300
Control Cell	1,045
4 Test Cells	2,040
Packaging	2,500
Warheading, SW	450
Component rework, stores	6,600
Other	5,755
<b>TOTAL</b>	<b>27,690</b>
<b>Harpoon</b>	
Assembly and holding area	13,425
Control Cell	925
2 Test Cells	920
Office and stores	860
<b>TOTAL</b>	<b>16,130</b>

212 40 MISSILE COMPONENT SLING TEST TOWER (EA)

**FAC: 2124**

**BFR Required: N**

21240-1 **DESCRIPTION.** This facility is used to test the tensile strength of all forms of weapons handling equipment such as slings, beams, bars, etc. It is used in testing developmental equipment and the periodic testing of handling equipment.

21240-2 **REQUIREMENT.** The tower is a requirement of any station that is involved with handling of heavy loads of ammunition, such as weapon stations and those activities that load and off load ammunition ships.

212 50 SUBMARINE LAUNCHED BALLISTIC MISSILE PROCESSING FACILITIES (SF)

**FAC: 2126**

**BFR Required: Y**

21250-1 **DESCRIPTION.** These facilities are required to receive components; checkout, assemble, refurbish, and repair Submarine Launched Ballistic Missiles (SLBMs) such as the TRIDENT II, D5 missile. Criteria for these facilities are dependent on the type of missile and have been developed and are available from the Navy's Strategic Systems Programs (SSP). All SLBM processing facilities are within high security areas and have special construction features such as high capacity environmental control systems, super flat floors, special trenching and conveying systems, and ordinance grounding and lightning protection systems.

21250-2 **REQUIREMENT.** No planning factors are currently available for this facility. For administrative spaces within these facilities, see Facility Class 600.

21250-2.1 Motor Transfer Facility (MTF). This facility provides the capability of receiving and transshipping SLBM missile motors and components and Active Inert Missiles (AIMs).

21250-2.2 Inert Component Control Building (ICCB). The ICCB provides for the support of missile systems level package processing, storage for guidance systems, missile assembly checkout, instrumentation sub-system/package checkout, AIM recertification, and electronic repair.

21250-2.3 Radiographic Inspection Building (RIB). The RIB provides the capability for film and computed tomography of SLBM rocket motors. It also provides a film radiographic capability for small ordnance components and low energy real-time radiography capability for gas generators.

21250-2.4 Missile Inspection Building (MIB). The MIB provides buildup and checkout of first, second, and third stage motors, Thrust Vector control (TVC) systems installation/ removal and leak test, motor pressurization (leak search), conduit installation, and igniter installation; additionally a cell will be provided to support motor nozzle removal/installation.

21250-2.5 Missile Assembly Building (MAB). The MAB provides the assembly, disassembly, and checkout of tactical SLBMs.

21250-2.6 Limited Area Processing and Storage Complex (LAPSC). The LAPSC receives processes and stores Strategic weapons Systems (SWS) components.

21250-2.7 Vertical Missile Packaging Building (VMPB). The VMPB provides for the packaging/un-packaging of SLBMs and the mating and de-mating of their SWS systems.

212 77 GUIDED MISSILES/SPARES STORAGE (READY ISSUE/ SHOP STORES/MISC.) (SF)

**FAC: 2121**

**BFR Required: Y**

21277-1 **DESCRIPTION.** These facilities are storage facilities for miscellaneous equipment or goods related to guided missiles that will be provided only where it can be individually justified.

21277-2 **REQUIREMENT.** There are no criteria for this type of facility. General information on normal stacking heights, SF per measurement ton requirements, and other parameters are provided in the Category Code 440 series.

## **213 MAINTENANCE - SHIPS AND FLOATING EQUIPMENT**

213-1 **FACILITY MAINTENANCE.** This basic category provides facilities for maintenance of vessels of all types. These facilities include graving dry docks, fixed cranes, marine railways, ship repair shops, and amphibian vehicle maintenance shops. For waterfront operational facilities, see Category Group 150. For administrative facilities, see Facility Class 600.

213 10 DRY DOCK (SF)

**FAC: 2131**

**BFR Required: Y**

21310-1      **DESCRIPTION.** A dry dock is a long narrow basin sited in the foreshore of a harbor. Its entrance is closed by a movable caisson or by gates. The basin is so constructed that a vessel may be placed in it and the water removed, allowing the vessel to settle on supports located on the dock floor. In this way the underwater portion of the vessel is exposed for routine maintenance and repair or for those coming into a dry dock in a damaged condition. Dry docks vary in size in accordance with the dimensional characteristics of the vessels to be serviced. Hence, each dock is designed and constructed to satisfy the special requirements of a particular vessel or class of vessels.

21310-2      **SITING A DRY DOCK.** The siting of a dry dock at an existing naval shipyard entails the analysis of many vital factors. Some recommendations for siting are the following:

1.      Locate the dry dock near the shipyard shop area for access to piping, electrical, woodworking, metalworking, machining and similar shops.
2.      Locate near sources of power and fresh water.
3.      Orient the dry dock to require the minimum length of track for gantry cranes.
4.      Provide adequate ship approaches to the docks. The approach or turning basin should have a width in front of the dock of at least two times the dock length properly oriented for turning. The depth should be no less than that at the entrance sill of the dry dock.
5.      Clearance must be provided from structures flanking the approach path of the ship. A distance of not less than 150 feet should be planned between such structures and the side of the ship to provide space for tugs to operate while maneuvering the ship.

21310-3      **DESIGN CRITERIA.** For design criteria, see NAVFAC DM-29.

213 20 MARINE RAILWAY (EA)

**FAC: 2132**

**BFR Required: Y**

21320-1 **DESCRIPTION.** The function of a marine railway is to bring a vessel out of the water for the purpose of making all parts available for overhaul, and to return the vessel to the water when the work is finished. The facility consists of rail trackage from a point on shore to an anchored position at a submerged depth; a railway beaching cradle or dolly for mating a vessel or small boat; and hauling machinery (hoist house) to pull the cradle-mounted vessel up the inclined track to a position on shore.

21320-2 **CAPACITY.** The capacity of a marine railway is usually given as the weight (displacement) in long tons of the largest ship that can be lifted. The maximum size and capacity of Navy marine railways has been restricted to about 3,000 tons that is the size required for the largest destroyer.

21320-3 **SITING.** The sites chosen for marine railways should satisfy the following requirements:

21320-3.1 **Distance to the Channel.** The distance from the high water line or the bulkhead line to the navigation channels must be adequate for construction of the offshore end of the railway, and must provide a safe fairway for vessels approaching and leaving the cradle.

21320-3.2 **Inshore Area.** The space available on land, including the frontage along the shore, must be sufficient for the inshore end of the railway, the hoist house, necessary clearances, spur tracks, roadways, cranes and working areas. Some of the larger marine railways will extend approximately 500 feet inshore.

21320-3.3 **Hydrographic Conditions.** The natural slope of the bottom along the offshore end of the railway, to prevent silting, should be lower than the grade of the tracks.

21320-3.4 **Foundations.** The soil conditions for the length of the railway must be of sufficiently high quality to make possible a design of foundations that will assure rigid control of settlement.

21320-3.5 **Favorable Climatic and Tidal Conditions.** The proposed location should be protected as much as possible from strong winds and waves.

21320-4 **DESIGN CRITERIA.** For design criteria, see NAVFAC DM-29.

213 30 SHORE INTERMEDIATE MAINTENANCE ACTIVITY (SIMA) (SF)

**FAC: 2133**

**BFR Required: Y**

21330-1 **DESCRIPTION.** This facility (SIMA) provides space for the fleet intermediate level maintenance operations. A SIMA has two basic components: maintenance shops and administration. These components may be established separately or as a consolidated complex.

21330-1.1 **Maintenance Shops.** Following is a partial list of functions in the maintenance component:

1. Machine Shop (Inside and Outside)
2. Hydraulic Shop; Valve and Regulator Shop; Pump and Pipe Shops
3. Boiler Shop; Automatic Combustion Control Shop
4. Optical Shop; Gyro Compass Shop; Test Equipment Shop
5. Internal Combustion Engine Shop; Gas Turbine Shop
6. Air Conditioning and Refrigeration Shop
7. Electrical, Electronics and Crypto Equipment Shops; Battery Shop
8. Sheet metal, Ship fitter and Welding Shops; Foundry
9. Carpenter, Pattern and Boat Repair Shops; Lagging and Insulation Shop
10. Riggers, Canvas and Paint Shops
11. Sandblasting Shop
12. Chemical, Metallurgical and Non-Destructive Testing Laboratories
13. Instrument Repair and Calibration Laboratory
14. Noise and Vibration-Analysis Laboratory

21330-1.2 **ADMINISTRATIVE SPACES.** The administrative component provides space for:

1. Offices; Central, Technical and Study Libraries; Records Storage
2. Classrooms, Projection Room, Audio-Visual Aid Preparation
3. Computer Operations and Analyst Record Storage



213 31 SHORE DEPOT LEVEL REPAIR SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21211-1 **DESCRIPTION.** An enclosed building used to perform depot level maintenance on components and accessories of ships and amphibious vehicles that cannot be repaired on board the vessels. This shop may include areas for electronics repair, welding, painting, small item fabrication, and a variety of other repair shop functions.

21211-2 No planning factors are currently available for this facility. An engineering analysis is needed to determine facility space requirements.

213 32 SHIPYARD DEMILITARIZATION AND RECYCLING FACILITY (SF)

**FAC: 2134**

**BFR Required: Y**

21211-1 **DESCRIPTION.** A Shipyard Demilitarization and Recycling Facility that is used to provide administrative, shop, logistics, and personnel support space in direct support of demilitarization and recycling of surface ships and submarines.

21211-2 No planning factors are currently available for this facility. An engineering analysis is needed to determine facility space requirements.

213 40 FIXED CRANE STRUCTURES (EA)

**FAC: 2137**

**BFR Required: Y**

21340-1 **DESCRIPTION.** The principal types of fixed cranes are pillar, pillar-jib, and jib. The hammerhead and tower cranes are also classed as stationary when mounted on fixed towers.

21340-2 **CRITERIA.** See NAVFAC DM-38, for criteria and procedures to be followed in the selection of weight handling equipment for specific installations.

213 41 THROUGH 213 67 - SHIP REPAIR SHOPS

21341 through 21367-1 **CATEGORY CODES.** Ship repair shops and related facilities included in Category Code series 213 are shown in Table 21341 through 21367-1.

**Tables 21341 through 21367-1. Ship Repair Shops and Related Facilities**

<b>Category Code</b>	<b>Description</b>
213 41	Central Tool Shop
213 42	Shipfitting Shop
213 43	Sheet Metal Shop
213 44	Forge and Heat Treat Shop
213 45	Welding Shop
213 48	Quality Assurance Office
213 49	Inside Machining Shop
213 50	Optical Shop
213 51	Weapons Shop
213 52	Marine Machining Shop
213 53	Boilermaking Shop
213 54	Electrical Shop
213 55	Pipefitting Shop
213 56	Woodworking Shop
213 57	Electronics Shop
213 58	Boat Shop
213 59	Abrasive Blast Facility
213 60	Paint and Blasting Shop
213 61	Rigging Shop
213 62	Sail Loft
213 63	Foundry
213 64	Patternmaking Shop
213 65	Nuclear Repair Shop
213 66	Temporary Services Shop
213 67	Pumphouse, Dry Docks

21341 through 21367-2 **DELETED CATEGORY CODES.** The following category codes have been deleted and the functions formerly performed therein have been reassigned to other category codes as indicated:

21341 through 21367-2.1 Category Code 213 46 (Galvanizing Shop) and Category Code 213 47 (Plating Shop) are now included in Category Code 213 49 (Inside Machining Shop).

21341 through 21367-2.2 Category Codes 213 50 (Optical Shop), 213 58 (Boat Shop), 213 59 (Abrasive Blast Facility) and 213-62 (Sail Loft) are not for use at the shipyards since these functions are included in other category codes for shipyards. These category codes are intended for use by other ship maintenance activities which support the repair of ships, such as ship repair facilities located at naval stations, intermediate maintenance activities, and other activities performing intermediate level maintenance rather than depot level maintenance.

21341 through 21367-3 **REQUIREMENTS.** There are currently no criteria available for these category codes. The quantitative requirements for shop facilities in Basic Category 213 should be determined on an individual basis, based on the experience and knowledge of the activity involved and the Naval Sea Systems Command. One method which can be used to develop the requirement for a specific shop is discussed below.

21341 through 21367-3.1 **EQUIPMENT TABLE.** Determine the types and number of pieces of equipment and laydown/workstation areas that the shop requires to perform their work. Develop a table that shows the following information: (a) name of equipment or laydown/workstation area; (b) actual floor area occupied by the equipment or area; and (c) any clearances required to allow access to the equipment/area, provide safety zones, or meet operational requirements. A sample table is shown in Table 21341 through 21367-2.

**Tables 21341 through 21367-2. Sample Equipment/Work Area Table**

Equipment/ Work Area	Qty	Footprint (LF)		Clearance (LF)				Overall Dimension (LF)		Total Area (SF)
		Front	Side	Right	Left	Front	Rear	Front	Side	
Table, Small	4	5	4	0	0	4	4	5	12	240
Table, Large	1	13	5	4	4	4	4	21	13	273
Grinder	1	3	3	3	3	3(1)	0	9	6	54
Drill Press	1	7	3	3	3	5(1)	5	13	13	169
Shear, 3/8"	1	19	14	3	3	10	1	25	25	625
TIG Welder	2	3	2	0	0	4(2)	1(2)	3	7	42

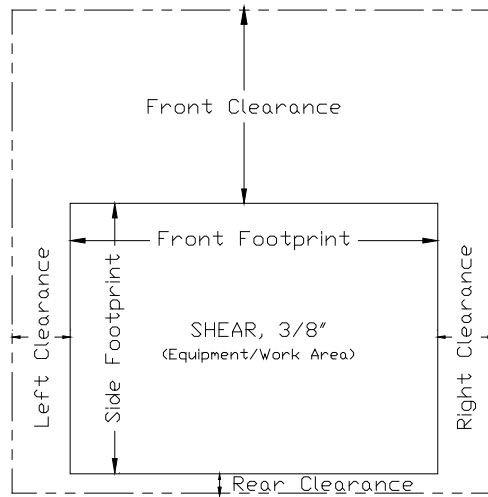
Equipment/ Work Area	Qty	Footprint (LF)		Clearance (LF)				Overall Dimension (LF)		Total Area (SF)
		Front	Side	Right	Left	Front	Rear	Front	Side	
Storage Rack	9	9	4	0	0	10	3	9	17	1,377

Equipment/Work Area clearances can be shared with other equipment clearances and circulation unless otherwise noted:

- (1) Clearances can be shared with clearances for other equipment/work areas, but not circulation.
- (2) Clearances can not be shared with other clearances or circulation.

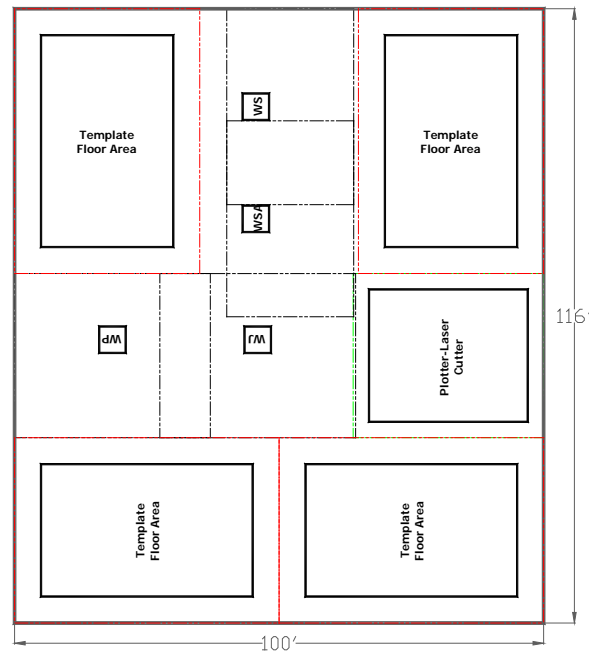
21341 through 21367-3.2 **DRAWINGS.** Once the table is completed, a conceptual drawing of an “ideal” shop containing the required equipment and areas can be completed to develop a net floor area requirement. As the drawing is developed, it is important to account for the following: (a) material and personnel flow in the shop and (b) how clearances can or cannot be shared. A sample drawing of a single piece of equipment/area is shown in Figure 21341 through 21367-1.

**Figures 21341 through 21367-1. Drawing of Equipment/Area and Clearances**



See Figure 21341 through 21367-2 for a sample drawing of a conceptual shop layout, where the solid lines show the actual equipment/area dimensions and the dashed lines show the clearance requirements.

**Figures 21341 through 21367-2. Sample Shop Layout Drawing**



21341 through 21367-3.3 **NET TO GROSS CONVERSION.** The drawing yields a net requirement in square feet for the shop. To convert this into a gross requirement, multiply the net requirement by 1.25.

213 41        CENTRAL TOOL SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21341-1        **CENTRAL TOOL SHOP (SHOP 06).** The central tool shop is responsible for the design, development, manufacture and maintenance of prototype and conventional tooling such as cutting machines, dies, molds, cleanliness plugs, cutters, jigs, fixtures, and special tools. The shop conducts the maintenance program for electrical and mechanical maintenance of numerically controlled and conventional machine tools and plant equipment. This includes installation, preventive maintenance, repair, analytical checkout, rehabilitation, and lubrication. This shop operates all tool rooms throughout the shipyard. Additionally, the shop operates high-pressure air equipment servicing ship systems as well as refilling high-pressure cylinders.

213 42        SHIPFITTING SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21342-1        **SHIPFITTING SHOP (SHOP 11).** The shipfitting shop is responsible for the back-shop modification, fabrication, repair, and assembly of various metal structural parts of the ship's hull, superstructure and interior ship structure by using shipfitting equipment, plate and shape structures, and other metals; and then through computer design, templating, laying-out, cutting, shaping, flanging, straightening, bending, and hot forming of all types and sizes of metal plates and shapes; and then positioning, aligning, fitting-up, and securing parts and subassemblies into ship component assemblies.

213 43        SHEET METAL SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21343-1        **SHEET METAL SHOP (SHOP 17).** The sheet metal shop is responsible for developing, fabricating, and installing ventilation and air conditioning ductwork; fabricating and installing store-room workshop and stowage facilities, non-structural bulkheads and partitions; the manufacture and installation of label plates; and outfitting of galley, berthing, habitability and office space for naval vessels.

213 44 FORGE AND HEAT TREATING SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21344-1 **FORGE AND HEAT TREATING SHOP (SHOP 11)**. The forge and heat treating shop is responsible for hot-forging, heat treating, inspecting, cleaning, and repairing various metal structural parts of a ship's hull, superstructure, interior ship structure, mechanical systems, machinery systems, anchor chain, and ship's propellers by using forging equipment, material billets, and other metals; and then through hammering, pressing, hot-rolling, heat-treating (annealing, tempering, hardening, quenching), sawing, threading, grinding, inspecting, and surface finishing (tumbling, cleaning, coating) of all types and sizes of metal shapes into a ready ship component.

213 45 WELDING SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21345-1 **WELDING SHOP (SHOP 26)**. The welding shop is responsible for all of the welding, flame cutting, carbon arc gauging, and related processes required by the various shops of the Operations and Production Resources Departments of the shipyard and the Public Works Center located at the shipyard. In addition to the major involvements of cutting and welding the various structural, sheet metal, and piping materials, operations include repair of castings, combating of valves, hard-surfacing of materials subjected to abrasive wear, shooting and welding studs and fasteners, metal spraying, casting, bonding, and welding of lead shielding, and stress relieving of shipboard elements.

213 48 QUALITY ASSURANCE OFFICE

**FAC: 2133**

**BFR Required: Y**

21348-1 **QUALITY ASSURANCE OFFICE (CODE 130)**. The quality assurance office is responsible for inspection and tests to determine compliance with specifications, plans, orders, directives, and sound shop and marine practices; non-destructive testing services; and technical direction, consulting and advisory services on those processes, materials, and systems for fabrication and repair to shops. It is also responsible for providing chemical and metallic laboratory services; test instrument calibration; and technical support for test, analyses, evaluation, and procedures for use of metallic and non-metallic materials.

213 49        INSIDE MACHINING SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21349-1        **INSIDE MACHINING SHOP (SHOP 31).** The inside machining shop is responsible for performing horizontal boring, vertical boring, planing and heavy lathe work in manufacturing, altering, and repairing ship machinery and shipyard manufactured items; performing engine lathe turning, horizontal and vertical turret lathe turning, boring, facing, and other turning work; performing milling, grinding, hobbing, broaching, shaping, slotting, lapping, honing, balancing work, layout work and drilling on castings and fabrications; and performing disassembly, inspection, reverse engineering, repair, reassembly, and testing of main propulsion units, pumps, valves, turbines, air compressors, propellers, and miscellaneous auxiliary machinery. This shop also assembles new manufactured equipment. Additionally, this shop is responsible for all metal finishing processes including electroplating, dalic plating, galvanizing, and metal polishing.

213 50        OPTICAL SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

No criteria are currently available for this code. This category code is not for use by shipyards. See the general discussion in paragraph 21341 through 21367-2.2.

213 51        WEAPONS SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21351-1        **WEAPONS SHOP.** The weapons shop is responsible for the repair, overhaul, alignment, installation, checking out, testing and calibration of all weapons systems, integrated systems, such as missile systems and associated components, including gun mounts, turrets, saluting batteries, launching pads, mechanical components of fire control, radar antennas and sonar equipment. This shop is also responsible for the repair, overhaul, calibration, and adjustments and testing of gunsights, range-finders, torpedo directors, telescopic gunsights, periscopes, binoculars, stereo-trainers, and other miscellaneous repair of instruments, etc.



213 52        MARINE MACHINING SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21352-1        **MARINE MACHINING SHOP (SHOP 38).** The marine machining shop is responsible for the installation and testing of all main propulsion machinery, auxiliaries, rudders, shafting, sea valves, deck machinery, laundry and galley equipment, arresting gear, and catapults on ships undergoing repair and conversion. This shop repairs, installs, and performs necessary tests on main and auxiliary diesel engines and their associated equipment as well as hydraulic speed gears on ships. The marine machining shop also refuels, repairs, and tests nuclear reactor plants as well as their associated systems and components. This shop works on any mechanical component that is removed from or installed on a ship or submarine.

213 53        BOILERMAKING SHOP (41) (D) (SF)

**FAC: 2133**

**BFR Required: Y**

21353-1        **BOILERMAKING SHOP (SHOP 41).** The boilermaking shop is responsible for the repair, conversion, and building of steam generating equipment used to furnish steam to main and auxiliary machinery. This includes the fabrication, assembly, installation, testing, cleaning, and repair of the steam generators, uptakes, stacks, and blower ducts as well as the fabrication, repair and testing of pressure vessels, incinerators, and spark arrestors.

213 54        ELECTRICAL SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21354-1        **ELECTRICAL SHOP (SHOP 51).** The electrical shop is responsible for accomplishing the installation, repair, maintenance, alteration, troubleshooting, and test of all power, lighting, and interior communication systems and equipment aboard Naval ships and submarines; for manufacture of switchboards, electrical control equipment, and components; for the installation, repair and alteration of nuclear electrical components and systems; and for repair and calibration of all electrical instrumentation.

213 55      PIPEFITTING SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21355-1      **PIPEFITTING (SHOP 56).** The pipefitting shop is responsible for accomplishing the layout, fabrication, installation, dismantling, repair, cleaning, testing, and inspection of piping systems and gaskets on both nuclear and non-nuclear systems in the shop as well as onboard ships and submarines; fabrication, repair, and installation of radar waveguides; installation, repair, and testing of refrigeration systems, air conditioning systems, and oxygen-nitrogen systems; and cleaning, testing and inspection of pressure vessels.

21355-2      **PIPE AND COMPONENT INSULATING (SHOP 57).** This group insulates steam, hot water and chilled water piping systems, ductwork and bulkheads aboard ship and performs some insulation and maintenance and repair on shipyard equipment such as furnaces.

213 56      WOODWORKING SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21356-1      **WOODWORKING SHOP (SHOP 64).** The woodworking shop is responsible for accomplishing operations performed by boat builders, woodcraftsmen, and shipwrights to construct and repair wooden and plastic boats, wooden portable buildings and shelters, hollow booms, wooden tank, practice torpedoes, and flight deck panels; repairing and manufacturing furniture and cabinets; laminating all sizes of wooden members; manufacture and repair accommodation ladders; perform dry kiln operations; and install and repair all types of acoustic and thermal insulations. Working from plans and specifications, they arrange docking blocks to provide for the dry docking of all classes of naval vessels and direct the positioning of the vessel for proper landing on the blocks. Additionally, the woodworking shop repairs and installs wooden decks, erects pipe stagings and lifelines; fabricates and installs boat stowages, builds shipping cradles, shores and blocks cargo aboard ships, manufactures and repairs wooden gangways and platforms, and fabricates and constructs refrigerated spaces aboard ships. This shop also manufactures plastic items such as pipe, radomes, fairwaters, tanks, antenna cones, and submarine fairing plates. They make resin foam pours in voids and perform grouting operations. The woodworking shop also installs and repairs plastic laminates and hull dampening materials on naval vessels and installs polyethylene shielding around nuclear reactors. They provide reference lines used in construction, repair, and alteration of all types of ships as well as taking measurements of ships' characteristics. This shop applies plastisol coatings; installs linoleum, rubber, asphalt, and ceramic tile. The sail loft section fabricates, repairs and installs

containments for nuclear and non-nuclear use, tents, weather covers, shrink wrap enclosures, upholstery, gun and other assorted covers.

213 57        ELECTRONICS SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21357-1        **ELECTRONICS SHOP (SHOPS 52, 66 AND 67).** The electronics shop is responsible for accomplishing installation, repair, overhaul, modification check-out, adjustment, test, and calibration of radar, sonar, communications, cryptographic data processing, antennas, navigation, and electronic countermeasure equipment and systems on and for surface ships, submarines, and shore stations. The electronics shop is also responsible for repair, calibration, and certification of electronic and nuclear instruments for the shipyard, ships, and shore activities; and installation, repair, and testing of gyro compasses.

213 58        BOAT SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

No criteria are currently available for this Category Code. This Category Code is not for use by shipyards. See the general discussion in paragraph 21341 through 21367-2.2.

213 59        ABRASIVE BLAST FACILITY (SF)

**FAC: 2133**

**BFR Required: Y**

No criteria are currently available for this code. This Category Code is not for use by shipyards. See the general discussion in paragraph 21341 through 21367-2.2.

213 60        PAINT AND BLASTING SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21360-1        **PAINT AND BLASTING SHOP (SHOP 71).** The paint and blasting shop is responsible for surface preparation, including abrasive blasting, for the application or installation of protective, decorative, and functional paints, coatings, films, and for

installation of deck, floor, and wall coverings. This includes design, layout, lettering, sign and poster making; silk screen processing; artificial and natural wood finishing; all types of painting and preservation on board ship; operation of pickling and chemical cleaning plant for preservation of material; abrasive blasting services; and the laying or installation of terrazzo, magnesite, and concrete.

213 61 RIGGING SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21361-1 **RIGGING SHOP (SHOP 72/CODE 700).** The rigging shop is responsible for operations performed by riggers, sailmakers, tank and component cleaners, laborers, upholsterers, fabric workers, and diving operations required for repair, overhaul, conversion, and construction of Naval vessels and equipment.

213 62 SAIL LOFT (SF)

**FAC: 2133**

**BFR Required: Y**

No criteria are currently available for this code. This category code is not for use by shipyards. See the general discussion in paragraph 21341 through 21367-2.2.

213 63 FOUNDRY (SF)

**FAC: 2133**

**BFR Required: Y**

21363-1 **FOUNDRY.** The foundry is responsible for manufacturing cores for iron, steel, and non-ferrous casting in the Core Unit; preparing and mixing sand, processing and making molds, steel castings, pouring steel from furnaces, melting, and manufacturing steel, and shaking out steel castings from molds after pouring in the steel foundry unit; pouring and melting non-ferrous metals and alloys, processing and making molds for brass castings, and shaking out non-ferrous castings in the non-ferrous unit; processing and making molds for iron castings, pouring iron, melting iron-alloys and shaking out iron castings from molds in the iron unit; clearing castings, shipping finished castings.

213 64        PATTERNMAKING SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21364-1        **PATTERNMAKING SHOP.** The patternmaking shop is responsible for the manufacture, repair, and alteration of wood patterns required to produce castings; manufacture of metal parts for wood and plastic patterns and metal patterns; manufacture of mock-ups for patterns; manufacture of sheet plastic by forming, fabricating, cementing, and dyeing; manufacture of plastic patterns; and receiving, storing and issuing pattern mock-ups and models.

213 65        SHIP PROPULSION MAINTENANCE FACILITY (SF)

**FAC: 2136**

**BFR Required: Y**

21365-1        **DESCRIPTION.** The Ship Propulsion Maintenance Facility is responsible for the repair of reactor plant components of ship propulsion systems.

213 66        TEMPORARY SERVICES SHOP (SF)

**FAC: 2133**

**BFR Required: Y**

21366-1        **TEMPORARY SERVICES SHOP (SHOP 99).** The temporary services shop is responsible for electrical, piping, and ventilation systems as related to temporary services. Temporary services include compressed air, water, steam, oxygen, electrical power and lighting, ventilation, telephones, inerting, air analysis, shipside sewage connections, communications systems, distilled water for ships' boilers, CO2 fire extinguishers, static dehumidification, electric, steam, and induction heat; besides responsibility for radioactive waste collection systems, delivery and distribution of pure water systems, distribution of temporary electric power, breathing air systems for reactor plants, chilled water and air conditioning systems, filtering for reactor plants, ventilation systems, communications systems involved in nuclear refueling operations, and deoxygenating pure water nitrogen systems. This shop also manufactures and repairs rubber products.

213 67 PUMPHOUSE, DRY DOCKS (SF)

**FAC: 2134**

**BFR Required: Y**

21367-1 **DESCRIPTION.** The dry dock pumphouse is used to house dry dock dewatering pumps and associated equipment.

213 68 DIVE SHOP (SF)

**FAC: 2134**

**BFR Required: Y**

21368-1 **CRITERIA.** No criteria are currently available for this code.

213 70 SHIP SERVICES SUPPORT BUILDING (SF)

**FAC: 2134**

**BFR Required: Y**

21370-1 **DESCRIPTION.** A ship services support building is used to provide office and shop space in direct support of maintenance and repair work for surface ships and submarines. The office area supports those individuals involved in executing work onboard ships, and includes people such as project superintendents, work supervisors, design engineers and test personnel. Additionally, quality assurance inspectors responsible for ship work inspection operate from these facilities. Another function in this type of facility is an area for kitting of material and work packaging. The purpose of the shop area is to perform rapid minor work required to support the maintenance and repair operations; i.e., rather than sending a small item requiring a minor modification back to the shop, the modification would be made at the dry dock or pier site.

21370-2 **REQUIREMENTS.** With the exception of shop space, all requirements are based upon the corresponding category codes providing those particular types of functions. For example, the administrative space for the office area is based on the criteria provided for in Category Code 610 10, Administrative Office. Required storage should be categorized under Category Code 213 77, Maintenance-Ship/Spares Storage (Ready Issue/Shop Stores/Miscellaneous). The quantitative requirements for shop facilities should be determined on an individual basis, based on the experience and knowledge of the activity involved and the Naval Sea Systems Command. See paragraph 21341 through 21367-3 for additional guidance on developing shop space requirements.

213 73 LANDING CRAFT WASH RACK (EA)

**FAC: 2135**

**BFR Required: Y**

21373-1 **DESCRIPTION.** The primary function of this facility is to wash down Landing Craft Air Cushions (LCAC) vehicles after every mission in order to remove sand and salt spray. However, this type of washdown pit may be used for other types of amphibious landing craft requiring similar purging. Wash water treatment is incorporated into the design of the facility.

21373-2 **REQUIREMENT.**

21373-2.1 **JEFF Type Craft.** A wash rack for JEFF type craft is 75 ft wide by 150 ft long. This criteria can be modified to suit other amphibious landing craft as well.

21373-2.2 **All Other Amphibious Landing Craft.** For all other type of amphibious landing craft requiring similar cleaning, select the largest craft that the facility will service and add 27 feet to its width and 30 feet to its overall length (with all ramps, doors, etc., extended) to determine the size of the washdown pit.

213 75 AMPHIBIAN VEHICLE MAINTENANCE SHOP (SF)

**FAC: 2134**

**BFR Required: Y**

21375-1 **DESCRIPTION.** The amphibian vehicle maintenance shop provides special work areas for performing all organizational maintenance functions on the amphibian vehicles of the Marine Corps Amphibious Tractor Battalion and in the case of the Navy, all organizational and intermediate level maintenance on Landing Craft Air Cushion (LCAC) vehicles. In the case of the latter, the depot level maintenance is performed at a Naval Air Rework Facility or contractor plant.

21375-2 **REQUIREMENT FOR MARINE CORPS.** The maintenance shop for the amphibian vehicles of the Marine Corps Amphibious Tractor Battalion includes administrative and training areas as well as storage space for OEM equipment, tools and mountout. Total shop area will vary depending upon the number of companies assigned to the Amphibious Tractor Battalion. A typical Marine Corp facility that would accommodate one battalion, i.e., four companies, would have a space requirement of 42,600 gross square feet of which 700 gross square feet would be dedicated to the mechanical equipment room. The size of the facility would be adjusted accordingly as

the number of companies in the battalion increase or decrease. See Definitive Designs, NAVFAC P-272, Part 4 for appropriate space allocations.

21375-3 **REQUIREMENT FOR LCAC (NAVY).** Criteria for a typical LCAC maintenance facility with 54 assigned craft is as follows:

21375-3.1 **Maintenance Bay.** Provide maintenance bay space for 15% of assigned craft. Note: LCAC craft is 48 ft. x 90 ft. with 15 ft. ramps on each end. Accordingly, bay space is increased to 75 ft. x 150 ft. or 11,250 net square ft. to allow sufficient work area around each craft. Net to gross conversion is 1 to 1.15, or:

$$11,250 \text{ NSF} \times 1.15 = 12,937.5 \text{ GSF}$$

$$12,937.5 \text{ GSF/craft} \times 8 \text{ craft} = 103,500 \text{ GSF}$$

21375-3.2 **Maintenance Shops.** Maintenance shops capable of providing organizational and intermediate level support are as follows:

Propeller shop	3,642 SF
Engine shop	1,101 SF
Hydraulic shop	522 SF
Skirt repair shop	2,216 SF
Welding shop	720 SF
Sheet metal shop	1,260 SF
Gluing shop	726 SF
Electrical shop	1,050 SF
Electronics shop	1,041 SF
Battery shop	396 SF
Tool room	1,185 SF
Locker room	5,375 SF
Maintenance control	<u>900 SF</u>
	20,134 SF

Net to Gross Conversion: 1:1.25 or  $20,134 \times 1.25 = 25,168 \text{ GSF}$

21375-3.3 **Control Tower/Operations Room.** A Control Tower/Operations Room is an additional requirement for a LCAC Operational Base and can be an integral part of the maintenance facility by providing an additional 190 GSF. This facility should have an unobstructed view of the parking apron, taxiway, ramp and waterfront in order to allow coordination of operations to preclude accidents. Communications equipment and traffic controllers are housed in this facility.

21375-3.4 **Squadron Operations/Training Space.** Squadron Operations/Training Space requirements are met by providing space for classrooms briefing room and a structural maintenance laboratory. The following



areas are provided to meet the requirements for a LCAC Operational Base having 54 assigned craft.

21375-3.4.1 **Training/Maintenance Space.** Compute the requirement for training/maintenance space within the Squadron Operations/Training Space as follows:

- Classroom Requirements: Using criteria for category code 171 10 for one 20 person operational class and one 20 person maintenance class,  $2 \times 20 \text{ PN} \times 22 \text{ SF/PN} = 880 \text{ NSF}$
- Briefing Room: A large classroom is required for general briefing and combined classes. Maximum loading is 40 persons. Accordingly,  $40 \text{ PN} \times 21 \text{ SF/PN} = 840 \text{ NSF}$
- Structural Maintenance Laboratory: Three mock-up equipment modules for skirt, prop, turbine, gear box and electronic bench yield  $219 \text{ NSF} \times 3 = 657 \text{ NSF}$
- Therefore, the total net requirement (classroom + briefing room + structural maintenance laboratory) equals  $880 \text{ NSF} + 840 \text{ NSF} + 657 \text{ NSF}$ , which equals 2,377. To convert the net requirement to a gross requirement, use a conversion factor of 1.33; i.e.,  $2,377 \text{ NSF} \times 1.33 = 3,160 \text{ GSF}$ .

21375-3.4.2 **Administrative Space.** The administrative space for 27 officers and 69 enlisted personnel =  $96 \text{ personnel} \times 150 \text{ GSF/PN} = 14,400 \text{ GSF}$ .

21375-3.4.3 **Composite Space Requirement.** The composite space requirement equals the combined sum of the training/maintenance and administrative spaces or:  $3,140 \text{ GSF (training/maintenance)} + 14,400 \text{ GSF (administrative)} = 17,560 \text{ GSF (total)}$ .

21375-3.5 **Total Requirement for a LCAC Maintenance Facility.** Accordingly, the total requirement for a LCAC maintenance facility supporting 54 craft is:

Maintenance Bay Space	103,500 GSF
Maintenance Shops	25,168 GSF
Control Tower/Operations Room	190 GSF
Squadron Operations/Training Space	<u>17,560 GSF</u>
Total	146,418 GSF

213 77 MAINTENANCE - SHIPS/SPARES STORAGE (READY ISSUE/SHOP STORES/MISC.) (SF)

**FAC: 4421**

**BFR Required: Y**

21377-1 **DESCRIPTION.** Storage facilities for miscellaneous equipment or goods related to ship maintenance facility support will be provided only where it can be individually justified.

21377-2 **REQUIREMENT.** There are no criteria for this type of facility. General information on normal stacking heights, square feet per measurement ton requirements, and other parameters are provided in the Category Code 440 series.

## **214 MAINTENANCE - TANK, AUTOMOTIVE**

214 Facilities for maintenance and repair of combat and noncombat motorized vehicles. For weapons, see Category Code series 215; for tracked amphibious vehicles see Category Code series 213; for construction equipment see Category Code series 218.

214 10 COMBAT VEHICLE MAINTENANCE SHOP (SF)

**FAC: 2141**

**BFR Required: Y**

21410-1 This facility provides specialized work areas, equipment, and storage for overhaul of combat vehicles such as self-propelled gun carriages and tanks. For Marine Corps Organizational Maintenance Shop, see Category Code 214 51; for Field Maintenance Shop, see Category Code 214 53.

214 20 AUTOMOTIVE VEHICLE MAINTENANCE SHOP (SF)

**FAC: 2141**

**BFR Required: Y**

21420-1 **PURPOSE AND FUNCTION.** Automotive vehicle maintenance facilities are required to provide covered work areas for inspection, maintenance, and repair of all transportation equipment assigned to an installation, and as applicable, its supported activities. For reasons of overall efficiency and economy, the maintenance and operations function for automotive, construction, materials handling, and railroad

equipment are combined. In areas where combined facilities are not feasible, special facilities for construction equipment maintenance and railroad equipment maintenance will be provided. See Category Codes 218 20 and 218 40 for planning data for separate shop facilities.

21420-2 **REQUIREMENTS.** The number and types of the equipment maintained by the activity will govern the size of the facility required, that is, the size is directly proportional to the number of general repair bays required to perform the assigned maintenance task. General repair space requirements are computed from the productive space factors contained in Tables 21420-1, 21420-2 and 21420-3. A 2-bay facility will be considered as the minimum requirement. After the repair bay requirements have been computed, the area required for administrative and indirect as well as direct support functions can be determined from Table 21420-4.

21420-3 **SPACE REQUIREMENTS.** Space requirements for an automotive vehicle maintenance shop are computed as follows:

21420-3.1 **Step 1.** Prepare an inventory listing by equipment costs codes for all of the equipment supported (see Column 1 of Tables 21420-1, 21420-2, and 21420-3). If a combined automotive/construction equipment/weight-handling maintenance shop is planned, consider all equipment codes; if a separate construction/weight-handling equipment shop is planned under Category Code 218 20, omit equipment cost codes 2300 to 2840, 3100 to 3720, 4210 to 4952, and 8120 to 8800 (to be used for determining Category Code 218 20 requirements).

21420-3.2 **Step 2.** Multiply the total equipment inventory as listed in Step 1 for each equipment code group by its corresponding space factor, (shown in Column 3 of the tables) to determine the repair bay requirements for that specific code group.

21420-3.3 **Step 3.** Total the individual code computations to determine the number of repair bays required for all of the equipment supported. For example:

Equipment Code	Number of Pieces	Productive Space Factor	Repair Bay Requirements
0061-0099	1	0.063	0.063
0102-0299	11	0.015	0.165
0300-0700	60	0.023	1.380
0800	25	0.016	0.400
1000	26	0.020	0.520

Equipment Code	Number of Pieces	Productive Space Factor	Repair Bay Requirements
2000	2	0.016	0.032
3000	1	0.025	0.025
4000	26	0.020	0.520
5000	47	0.016	0.752
7000	6	0.030	0.180
8000	3	0.092	0.276
Total repair bay requirements			4.313 (or 4 bays)

21420-4 Column (1) is done in even numbers. If the calculation of the number of repair bays is less than the odd number 5 as shown in the example, round down to the next even number 4. If the calculation is more than the odd number of bays (i.e., 5.313), round up to the next even number of bays (i.e., 6).

21420-5 To determine the total square-footage of area required for general repair bays multiply the number of bays determined in Step 3 by 480 (the square footage of a single 16 by 30 foot general repair bay). The number of square feet of administrative and indirect support area requirements is directly proportional to the number of repair bays, as shown in Column 3 of Table 21420-4.

21420-5.1 The administrative and indirect support area includes the following facilities:

1. Administrative office for maintenance and operations personnel.
2. Drivers and operators training, licensing, and ready room.
3. Locker, lunch, and conference room.
4. Toilet facilities.
5. Parts supply, issue, and storage room.
6. Tool room.

21420-6 In addition to repair bay and administrative area requirements, consideration must also be given to such direct support facilities as tire shop, body shop, battery shop, engine and accessories overhaul shop, paint shop, dynamometer test bay, steam cleaning and wash bay, and lube storage. Engine overhaul and paint and body shops should be provided.

21420-7 The direct support facility requirements shown in column 4 of Table 21420-4 provide for complete shop facilities. The total gross space allowance in column 5 is the maximum allowed for the indicated number of repair bays.

### **General Work Bay Space Factors**

**Table 21420-1. Automotive Equipment Codes 0061 through 0905**

<b>Equipment Cost Code (Column 1)</b>	<b>Abbreviated Description (Column 2)</b>	<b>Productive Space Factor (Column 3)</b>
0061 to 0099	Buses	0.063
0102 to 0299	Sedans, station wagons, and ambulances	0.015
0300 to 0745	Trucks	0.023
0800 to 0897	Trailers	0.016
0900 to 0905	Motorcycles, scooters, etc.	0.004

**Table 21420-2. Materials Handling Equipment Codes 1100 through 1900**

<b>Equipment Cost Code (Column 1)</b>	<b>Abbreviated Description (Column 2)</b>	<b>Productive Space Factor (Column 3)</b>
1100 to 1900	Tractors (warehouse) Trucks (fork-lift, crane platform and side loaders)	0.020

**Table 21420-3. Construction and Allied Equipment Codes 2300 Through 8800**

<b>Equipment Cost Code (Column 1)</b>	<b>Abbreviated Description (Column 2)</b>	<b>Productive Space Factor (Column 3)</b>
2300 to 2840	Crushing, mixing, batching and paving equipment (mixers, pavers, distributors, spreaders, heaters)	0.016
3100 to 3720	Drilling, blasting, and driving equipment (compressors and drills)	0.025
4210 to 4952	Excavating and grading equipment (crawler cranes, graders, loaders, rollers, scrapers, tractors, etc.)	0.020
5110 to 5930	Miscellaneous construction and maintenance equipment (generators, pumps, cleaners, sweepers, mowers, snowplows, garbage trucks, mobile shops)	0.016
7100 to 7501	Firefighting equipment (trucks, pumps, etc.)	0.030
8120 to 8800	Weight handling equipment (truck mounted, cruiser, and boat cranes)	0.092

21420-8 **SITE LOCATION.** In choosing a site for new transportation equipment maintenance facility a number of conditions should be given careful consideration. The facility should be located adjacent to or within the major industrial area which it serves. Caution should be exercised to ensure that the site selected has adequate land area to accommodate all support facilities, equipment holding and parking area, and sufficient room for employee parking. Criteria for employee parking can be found in Category Code 852 10. Site location may be influenced to some degree when railroad equipment is involved because of the track location and approach.

21420-9 **MAINTENANCE FACILITY.** When available sites for the automotive vehicle maintenance facility prove to be either inadequate or inappropriate for the inclusion of construction and/or railroad equipment maintenance, separate shop structures for the service and maintenance of these types of equipment will be provided. See Code 218 40 for planning criteria for a special railroad equipment maintenance shop.

**Table 21420-4. Space Requirements for Automotive Vehicle Maintenance Facility**

Repair Bays		Administrative and Indirect Support Area (Sq. ft.) (Column 3)	Direct Support Area (Sq. ft.) (Column 4)	Total Gross Space Allowance (Sq. ft.) (Column 5)
(No.) (Column 1)	(Sq. ft.) (Column 2)			
2	960	600	1,440	3,000
4	1,920	1,500	2,720	6,140
6	2,880	1,950	3,480	8,310
8	3,840	2,400	4,230	10,470
10	4,800	3,100	4,270	12,170
12	5,760	3,800	5,210	14,770
14	6,720	4,200	6,000	16,920
16	7,680	4,700	6,070	18,450
18	8,640	5,100	6,080	19,820
20	9,600	5,500	6,170	21,270
22	10,560	5,900	6,210	22,670
24	11,520	6,300	6,250	24,070
26	12,480	6,850	6,290	25,620
28	13,440	7,400	6,330	27,170
30	14,400	7,750	6,370	28,520
32	15,360	8,100	6,480	29,940

Repair Bays		Administrative and Indirect Support Area (Sq. ft.) (Column 3)	Direct Support Area (Sq. ft.) (Column 4)	Total Gross Space Allowance (Sq. ft.) (Column 5)
(No.) (Column 1)	(Sq. ft.) (Column 2)			
34	16,320	8,400	6,520	31,240
36	17,280	8,700	6,560	32,540
37	18,240	9,000	6,580	33,820
40	19,200	9,300	6,600	35,100
42	20,160	9,600	6,640	36,400
44	21,120	9,900	6,680	37,700
46	22,080	10,200	6,720	39,000
48	23,040	10,500	6,780	40,320

214 30 REFUELING VEHICLE SHOP (SF)

**FAC: 2141**

**BFR Required: Y**

21430-1 **AIRCRAFT REFUELER TRUCKS.** Aircraft refueler trucks and other portable fuel dispensing equipment are not serviced or repaired in the automotive vehicle maintenance shop because of the explosive hazard involved. Accordingly, a separate explosion proof and fire-resistant maintenance/repair facility is provided. The facility is located a minimum of 100 feet from other structures. See Table 21430-1 for the refueling vehicle shop space allowances.

**Table 21430-1. Space Allowances - Refueling Vehicle Shop**

No. of Refuelers Supported	No. of Repair Stalls	Gross Area (Sq ft)
Up to 8	1	1,080
9 to 16*	2	1,800

\* One additional 720-square-foot (16 x 45 ft) stall may be planned for each increment of eight refuelers above sixteen.

One 16 x 45 foot pad for purging fuel tanks should be provided for each facility.

214 40 VEHICLE HOLDING SHED (AWAITING PARTS AND REPAIR) (SF)

**FAC: 2185**

**BFR Required: Y**

21440-1 **DEADLINED EQUIPMENT.** This facility is a part of the automotive vehicle maintenance shop with the main purpose of providing a covered area for holding deadlined equipment awaiting repairs. Whenever possible, it should be located near the main repair shops. Space requirements are computed as follows:

21440-1.1 **Self-propelled Equipment.** Provide one bay or stall for every 30 pieces of self-propelled equipment supported up to 1,000 units and one additional bay for every 50 units supported over 1,000. Bays will be 12 feet by 35 feet or 420 square feet in area.

214 51 AUTOMOTIVE ORGANIZATIONAL SHOP (SF)

**FAC: 2141**

**BFR Required: Y**

21451-1 This facility provides work areas for Fleet Marine Force (FMF) units to perform maintenance on items of organizational equipment. The shop space includes administrative and dispatching areas as well as storage for OEM equipment, tools, and parts.

21451-2 This category code includes requirements previously given in Category Code 214 52, Combat Organizational Shop (now deleted).

21451-3 Conduct an engineering study to determine requirements.

214 53 FIELD MAINTENANCE SHOP (COMBAT / AUTOMOTIVE / TRACK) (SF)

**FAC: 2141**

**BFR Required: Y**

21453-1 This facility provides specialized work areas for performing 3rd and 4th echelon maintenance functions on items of tactical equipment involving primarily rolling stock items of motor transport and engineer equipment. These are limited to use by the Service Battalion of the Marine Division and appropriate elements of the Force Service Regiment. The shop space includes administrative and training areas as well as storage space for tools, parts, and maintenance float equipment.



21453-2 For other field maintenance functions see Category Codes 215 60, 217 30, and 218 80.

21453-3 Conduct an engineering study to determine requirements.

214 55 VEHICLE WASH PLATFORM (SF)

**FAC: 2145**

**BFR Required: N**

21455-1 **REQUIREMENTS.** Vehicle wash platforms equipped with hose connections should be provided on the basis of one vehicle washing space for each 50 vehicles assigned to the motor pool. Where the motor pool supports multiple commands (Expeditionary Support Units) vehicle wash platforms should be sized based on the number of self-powered Civil Engineering Support Equipment (CESE) assigned to the ESU and the largest single command's CESE in the supportive Command. Where CESE and Service Craft and Boat Accounting Report (SABAR; vehicles/boats) are both present in the command, it is to be assumed that the CESE count alone will support the wash platform requirements. Where a single motor pool supports a single command of 150 plus pieces of self-powered CESE, the wash platform will be sized on the average number of self-powered pieces of CESE withdrawn in support either training or deployment. Vehicle wash platforms are also used to clean the SABAR assigned to the command but the SABAR does not count against total component count. A sediment basin for grit and soil will be provided and will drain into an oil water separator. Gross calculated area includes the sediment basin. . Vehicle wash platform/sediment basin(s) should be covered to reduce the amount of rain water to be treated by the oil water separator (see below for property record card use). Although a BFR is not required for the CCN, a BFR is provided for planning purposes. Final platform/ sediment basin details will be developed at design/construction phases.

21455-2 **PROPERTY RECORD CARD (PRC) USE.** See below guidance on appropriate property record card use. Use CCN 14313 "Operational Vehicle and Equipment Canopy" to capture any canopies associated with wash racks:

- Capture all vehicle wash racks at single location on a single property record card. Record the quantity of wash racks using the primary UM (EA) and the total square footage amount (cumulative for all racks) under the area UM (SF).
- Capture any overhead canopies under CCN 14313 (see above) on separate property record cards from the wash platform. If the canopy is contiguous, one PRC will suffice and both its quantity (1; EA) and area (SF) should be captured. If the actual canopy dimensions or design drawings are unavailable to determine the area, an estimate can be made by measuring the structural system layout and adding an estimate of the canopy overhang on each side. Where multiple canopies are observed, each will have its own facility number and PRC.

- In the “Notes” section of all associated PRCs, delineate the site location for references purposes.

214 56 GREASE RACK (EA)  
**FAC: 2145**  
**BFR Required: N**

21456-1 One grease rack (two vehicles) will be provided for each 125 vehicles.

## **215 MAINTENANCE - WEAPONS, SPARES**

215-1 This group includes facilities for maintenance of small arms, automatic weapons, mortars, artillery guns, launchers, flamethrowers, torpedo tubes, harbor protective nets, and non-electronic equipment. See UFC 4-229-01N for design criteria. For missile maintenance facilities, see Category Group 212.

215 10 SMALL ARMS SHOP (SF)  
**FAC: 2152**  
**BFR Required: Y**

21510-1 A small arms shop is used to support small arms maintenance and repair for various Marine Corps activities or units. This shop is required in order to perform the pre-fire inspection (LTI) of all small arms weapons issued and recovered and to repair those weapons which are damaged or which malfunction. The weapons are broken down, visually inspected, inspected by use of various gages, magnifying glasses, etc., repaired, lubricated, etc., and reassembled.

21510-2 The criteria indicated for category code 143-45, Armory, should provide adequate space allocation for any type of small arms shop provided: (a) the armory services only the activity at which it is located and (b) the small arms weapons are limited to those personnel physically stationed at that activity.

21510-3 This shop is a small arms maintenance and repair facility and the weapons serviced here are not limited to those handled by the personnel assigned to the activity at which it is located. Accordingly, the size of the shop is based upon the number of weapons repaired per month and not like the armory, whose size is determined by the number of personnel stationed at the activity.

21510-3.1 A small arms shop shall meet the following requirements:

- a. Positive weapon security in a humidity controlled, secure environment.
- b. A rapid, individual weapon issue/recovery system.
- c. A quick, twice daily inventory capability of all weapons.
- d. Weapon repair bench (each).
- e. A weapon maintenance area for individual weapon maintenance by the person to whom the weapon is assigned.
- f. Space for a technical library.
- g. Space for the storage of sensitive or highly pilferable emergency supplies for assigned reaction forces.
- h. Parts storage.
- i. Weapons cleaning and coating area.
- j. Secured flammable storage area.

21510-4 The size of the shop is governed by the average number of weapons serviced during an average month. See Table 21510-1 for gross square foot allowance to determine the area requirement.

**Table 21510-1. Small Arms Shop**

Number of Weapons Serviced per Month	Gross Square Feet per Weapon
Up to 1,000	1.25
1,000 to 2,000	1.10
2,000 to 5,000	1.00
5,000 to 10,000	0.074
For each weapon over 10,000	Add 0.20

*Example: The number of gross square feet required for a small arms shop servicing 10,350 weapons per month is:  $10,350 \times 0.20 + 2,070$  gross square feet.*

215 20 LIGHT GUN (20 MM TO 5 IN) SHOP (SF)

**FAC: 2152**

**BFR Required: Y**

215 30 HEAVY GUN (6 IN TO 16 IN) SHOP (SF)

**FAC: 2152**

**BFR Required: Y**

215 40 HARBOR PROTECTIVE NET SHOP (SF)

**FAC: 2134**

**BFR Required: N**

215 50 LAUNCHER AND PROJECTOR MAINTENANCE SHOP (SF)

**FAC: 2152**

**BFR Required: Y**

21520/30/40/50-1 At present there are no criteria for Category Codes 215 20 through 215 50. However an engineering space analysis based on maintenance throughput, ordnance equipment size, maintenance staffing, and support space should determine the space requirements.

215 60 FIELD MAINTENANCE SHOP (ORDNANCE) (SF)

**FAC: 2151**

**BFR Required: Y**

21560-1 This field maintenance shop provides specialized work areas for performing 3rd and 4th echelon maintenance on all items of ordnance equipment authorized repaired by the Force Service Support Group (FSSG). The shop space includes administrative and training areas as well as storage space for tools, parts, and maintenance float equipment. Perform an engineering space analysis based on maintenance throughput, ordnance equipment size, maintenance staffing and support space should determine the space requirements.

21560-2 For other field maintenance functions, see Category Codes 214 53, 217 30, and 218 80.

## **216 MAINTENANCE AMMUNITION, EXPLOSIVES & TOXICS**

216-1 **DEFINITION.** This group includes facilities for maintenance of ammunition, rockets, bombs, mines, grenades, torpedoes, depth charges, demolition materials, pyrotechnics, missile fuels, and related chemicals. OPNAV Instruction 8000.16 series provides maintenance policies, procedures, and responsibilities for the conduct of the Naval Ordnance Maintenance Management Program. Siting criteria and guidance on standard operating procedures for these facilities can be found in NAVSEA OP-5 Vol. 1. Consult the design criteria, UFC 4-216-02, when developing space requirements.

216 05 CHANGE/RELIEF HOUSE (SF)

**FAC: 2162**

**BFR Required: N**

21605-1 **DEFINITION.** This is a building, typically associated with explosives operating building(s), containing facilities for employees to change to and from work clothes. This facility may provide sanitary services, drinking fountains, lockers, and lunchrooms and may house the explosive plant office. See NAVSEA OP-5 for siting considerations.

21605-2 **CRITERIA.** There is no planning criterion for this function. Given the above listed functions and the number of personnel expected to use the facility, an engineering space analysis should produce an adequate requirement.

216 10 AMMUNITION REWORK AND OVERHAUL SHOP (SF)

**FAC: 2162**

**BFR Required: Y**

21610-1 **DEFINITION.** Overhauling ammunition includes determining the serviceability of the primary components of an item, and performing exterior maintenance as required to render the item fully serviceable.

21610-2 **CRITERIA.** There is no planning criterion for this function. An engineering space analysis based on the type of ammunition, maintenance throughput, ordnance equipment size, maintenance staffing, storage and support space should determine the space requirements.

216 20 ROCKET REWORK AND OVERHAUL SHOP (SF)

**FAC: 2162**

**BFR Required: Y**

21620-1 **DEFINITION.** Overhauling rockets includes determining the serviceability of the primary components of an item, and performing exterior maintenance as required to render the item fully serviceable.

21620-2 **CRITERIA.** There is no planning criterion for this function. An engineering space analysis based on maintenance throughput, ordnance equipment size, maintenance staffing, storage and support space should determine the space requirements.

216 30 MINES AND DEPTH CHARGE REWORK AND OVERHAUL SHOP (SF)

**FAC: 2162**

**BFR Required: Y**

21630-1 **DEFINITION.** Overhauling mines and depth charges includes determining the serviceability of the primary components of an item, and performing exterior maintenance as required to render the item fully serviceable.

21630-2 **CRITERIA.** There is no planning criterion for this function. An engineering space analysis based on maintenance throughput, ordnance equipment size, maintenance staffing, storage and support space should determine the space requirements.

216 40 TORPEDO SHOP (SF)

**FAC: 2162**

**BFR Required: Y**

21640-1 **DEFINITION.** Torpedo shop functions include, but are not limited to: preventive and corrective maintenance as well as hardware and operational software upgrades on torpedo Warshot and Exercise configurations. The Exercise configuration is recovered after firing and is processed for reuse. Torpedo processing includes complete disassembly, repair and reassembly into the desired configuration. The torpedo shops require special industrial processes to handle the OTTO fuel II used in torpedo propulsion systems. Typically suites of electronic and mechanical test equipment are required to support different torpedo functions and components. Maintenance processes are documented in Technical Manuals series SW13-EO-PRO-10 thru 060, which are maintained by Naval Undersea Warfare Center Newport.

21640-2 **CRITERIA.** There is no planning criterion for this function. An engineering space analysis based on maintenance throughput, equipment size, maintenance staffing, storage and support space should determine the space requirements.

216 50 SPECIAL WEAPONS SHOP (SF)

**FAC: 2153**

**BFR Required: Y**

21650-1 **DEFINITION.** Special weapons shop functions include, but are not limited to, determining the serviceability of the primary components of an item, and performing exterior maintenance as required to render the item fully serviceable.

21650-2 **CRITERIA.** There is no planning criterion for this function. An engineering space analysis based on maintenance throughput, ordnance equipment size, maintenance staffing, storage and support space should determine the space requirements.

216 55 AIR/UNDERWATER WEAPONS SHOP (AIRBORNE TORPEDOES/AIRDROP WEAPONS) (SF)

**FAC: 2161**

**BFR Required: Y**

21655-1 **AIR/UNDERWATER WEAPONS (AUW) SHOP.** An Air/Underwater Weapons (AUW) Shop is required at Navy and Marine Corps air stations as designated by the Chief of Naval Operations. The AUW shop contains space and equipment for the storage, test, check, assembly, and limited maintenance of airborne torpedoes and other airdrop weapons.

21655-2 **CRITERIA.** When an AUW Shop is authorized, the standard shop has the following requirements:

Shop Building	7,192 gross square feet
Vehicle Shelter	1,612 gross square feet

Floor plan templates are shown in UFC 4-126-02.

216 60 QUALITY EVALUATION LABORATORY (SF)

**FAC: 2162**

**BFR Required: Y**

21660-1 **QUALITY EVALUATION LABORATORY.** A Quality Evaluation Laboratory (QEL) supports the QE program by performing analysis and tests to determine and maintain quality assurance of ammunition, explosives and toxins.

21660-2 **CRITERIA.** There is no planning criterion for this function. An engineering space analysis based on throughput, equipment size, lab space requirements, staffing and support space should determine the space requirements.

216 77        AMMUNITION/EXPLOSIVES MAINTENANCE STORAGE (SF)

**FAC: 2162**

**BFR Required: Y**

21677-1        **AMMUNITION/EXPLOSIVES MAINTENANCE STORAGE.** Storage facilities for miscellaneous equipment related to ammunition/explosives maintenance facilities will be provided only where it can be individually justified.

21677-2        **CRITERIA.** There are no criteria for this type of facility. General information on normal stacking heights, net to gross multipliers, and other parameters are provided in Category Code 440 series.

## **217            MAINTENANCE - ELECTRONICS AND COMMUNICATION EQUIPMENT**

217-1           This basic category includes facilities and shops for maintenance and repair of radio and radar equipment, antennas, radiation aids, sonar equipment, transmission and reception equipment, and guided bombs.

217 10        ELECTRONICS/COMMUNICATIONS MAINTENANCE SHOP (SF)

**FAC: 2171**

**BFR Required: Y**

21710-1        Electronics maintenance shops at Naval and Marine Corps activities provide facilities for maintenance and repair of non-airborne equipment (see Category Code 211 45, Avionics Shop (Non-NAVAIR Depot) for airborne equipment repair facilities).

21710-2        It contains office and support spaces for the Equipment Maintenance Officer (EMO) and the EMO Staff, equipment maintenance and training areas, and a small storage area for parts and supplies directly under the control of the EMO. A small electronics and communications maintenance shop integral to the function it supports should be contained within the analysis of that function and not classified as Category Code 217 10.

21710-3        No specific criteria are provided. An engineering evaluation can be conducted to determine the office space and support area requirements using guidance contained within the Category Code series 131 Introductory section. For maintenance and training area, the quantity and type of items required may be selected from Table 131 and appropriate allowances applied. For storage area, an engineering evaluation can be used to determine the volume of material required to be stored. The standard



stacking height for this type of material is 1.83 meters (6 feet). A factor of 1.07nsm/cm is applied to the volume of material to determine the required net square meters (m<sup>2</sup>). A conversion factor of 1.65 for net square meters to gross square meters is appropriate.

217 20        COLLIMATION TOWER (EA)

**FAC: 2173**

**BFR Required: N**

21720-1       Collimation facilities are required at shipyards for electronic and optical alignment of fire control and radar equipment aboard ships. This facility consists of a steel tower approximately 125 to 150 feet in height and a small instrument building at the lower base.

217 30        FIELD MAINTENANCE SHOP (COMMUNICATIONS/ ELECTRONICS)  
(SF)

**FAC: 2171**

**BFR Required: Y**

21730-1       This field maintenance shop provides specialized work areas for performing 3rd and 4th echelon maintenance on all items of communications/electronics equipment authorized repaired by the Service Battalion of the Marine Division and the Force Service Regiment. The shop space includes administrative and training areas as well as storage space for tools, parts, and maintenance float equipment. For other field maintenance functions, see Category Codes 214 53, 215 60 and 218 80. Conduct an engineering study to determine requirements.

217 40        ANTENNA TEST RANGE (EA)

**FAC: 2173**

**BFR Required: N**

21740-1       This facility is for testing electronic equipment and communication antennas after completion of maintenance, repair and overhaul work. This range has to be individually planned. Standard planning factors are not available.

217 50      SENSOR ACCURACY CHECK SITE (SACS) (EA)

**FAC: 2173**

**BFR Required: Y**

21750-1      The primary purpose of this facility is to measure the performance of shipboard sensors in an in-port environment on completion of overhaul or during normal port upkeep of Navy ships. This facility can be planned for only when authorized by the Commander, Naval Sea Systems Command.

21750-2      The SACS is a unique test and evaluation facility which provides an independent, real-time measure of gyrocompass, sonar, echo sounder and sonar communications set performance and accuracy. The SACS design permits sensor evaluations under test conditions especially favorable to the ship: (1) the ship is tested in port with all normal dockside facilities available; (2) measurements are external to the ship so that "at sea" performance is determined; (3) data are analyzed in real-time providing immediate identification of sensor deficiencies and verification of corrective actions; and (4) all major sonar parameters are measured in a single comprehensive test.

21750-3      **THE MAJOR COMPONENTS OF A FACILITY ARE:**

21750-3.1    **Control Center:** The building in which test points on the ship's sensors are monitored, and control is maintained over all SACS equipment. The building contains signal generating, receiving and processing devices and automatic data acquisition and analysis equipment.

21750-3.2    **Pile Mounted Transducers.** Transducers mounted to the 31 pilings of the SACS array. The transducers are spaced at 10-degree intervals and are used for sonar range and bearing error measurements.

21750-3.3    **Moveable Carriage with Transducer.** A calibrated directional transducer that can be moved vertically and in azimuth; it is used for receiver and transmitter performance measurements.

21750-3.4    **Ship's Transducer Location System (STLS).** A system of three transducers used to continuously monitor the position of the ship's sonar transducer to an uncertainty of less than one inch.

21750-3.5    **Automatic Ship's Head Measuring System (ASHMS).** A system of specially configured TV cameras that is used to provide ship's heading to an accuracy of better than 0.01 degree.

21750-3.6    **Mooring System.** A system of five hydraulic winches from which wire ropes are extended to the ship in order to maintain the ship's sonar transducer near the center of the SACS array.

21750-3.7 **Slip Services.** The ship is provided 800 amps, 440 volts, steam, fresh water, telephone connections and generous parking space while in port.

21750-3.8 **Echo Sounder Test Array:** An array of four transducers placed on the bottom of the bay directly below the ship's fathometer.

21750-3.9 **Depth.** A minimum depth of 50 feet Mean Lower Low Water is required at the site of the subject facility due to the variety of vessels that can be expected to be serviced.

217 77 ELECTRONICS - SPARES AND STORAGE (READY ISSUE/SHOP STORES/MISCELLANEOUS) (SF)

**FAC: 2171**

**BFR Required: Y**

21777-1 **Electronics and Communications Storage.** Support multiple commands or multiple Departments/Divisions within a command. It is under the control of the Communications Department. Storage of material under the control of the Logistics and Supply Department should be classified within CCN 143-77. Storage areas in support of small electronics and communications maintenance shops integral to the function they support are considered part of those functions.

21777-2 **No specific criteria provided.** An engineering evaluation can be used to determine the volume, in cubic meters (cm), of material required to be stored. The standard stacking height for this type of material is 1.83 meters (6 feet). A factor of 1.07nsm/cm is applied to the volume of material to determine the required net square meters (m<sup>2</sup>). A conversion factor of 1.65 for net square meters to gross square meters is appropriate.

## **218 MAINTENANCE - MISCELLANEOUS PROCURED ITEMS AND EQUIPMENT**

218 10 CONTAINER REPAIR AND TEST BUILDING (SF)

**FAC: 2182**

**BFR Required: Y**

21810-1 A container repair and test facility services only empty containers. The size of the facility is predicated upon processing approximately 1 percent of the containers and chassis involved in the handling and shipping operations. The facility

provides for structural testing, minor repairs, and cosmetic services for damaged or structurally marginal containers.

21810-2 Assuming a 750-container throughput capability per 24-hour day, the number of bays in the repair facility can be estimated as follows:

$1\% \times 750 = 7.5$  containers per day

Assume 4 hours work per container -  $4 \times 7.5 = 30$  hours

Assume 8 hours working day -  $30 / 8 = 3.75$ , say 4 bays

21810-3 A typical 4-bay facility with supporting tool room, administrative space, and personnel support area is shown in Figure 218-10. The bays are serviced by a bridge crane with a lifting capacity of 5 tons. Storage space of 2,130 square yards for 16 empty containers should be provided adjacent to the facility. The 4 bays testing and repair area is 1,920 square feet. The administrative space is 800 square feet for a total gross area of 2,720 square feet.

218 20 CONSTRUCTION/WEIGHT HANDLING EQUIPMENT SHOP (SF)

**FAC: 2182**

**BFR Required: Y**

21820-1 Special shop structures for the maintenance and repair of construction/weight-handling equipment are planned only for areas where combined automotive, weight-handling, railroad and/or construction equipment maintenance facilities are not feasible. Construction/weight-handling equipment shop requirements are based on the space factors contained in Category Code 214 20, Automotive Vehicle Maintenance Shop.

21820-2 Included in this category are special construction and utility shops for Marine Corps units. These shops are normally part of the Headquarters Battalion, Force Service Regiment, and the Fleet Marine Force (FMF) Engineer Battalions. Conduct an engineering study to determine requirements.

218 25 MARINE AIR-BASE SQUADRON (MABS) FACILITY (SF)

**FAC: 2181**

**BFR Required: Y**

21825-1 This Category Code is used for inventory purposes only.

218 30 DRUM RECONDITIONING PLANT (SF)

**FAC: 2182**

**BFR Required: Y**

21830-1 The drum reconditioning plant is planned for those fuel facilities where fuel drums are returned for refilling or storage before reissue. Normal drums that require reconditioning at frequent intervals are the 55-gallon steel type. The drum reconditioning facility requires a minimum of two buildings; one for the boiler plant and the other housing the reconditioning facilities. The boiler house will be approximately 800 square feet, and the reconditioning building housing the internal washing, dedenting, internal chaining, external wire brushing, chime rolling, testing, welding, internal preservation, and painting will be approximately 3,600 square feet. This plant has a capacity of approximately 3,000 55-gallon drums per month.

218 35 CABLE REPAIR HOUSE (SF)

**FAC: 2182**

**BFR Required: Y**

21835-1 No criteria are currently available for this Category Code.

218 40 RAILROAD EQUIPMENT SHOP (SF)

**FAC: 2183**

**BFR Required: Y**

21840-1 The railroad equipment maintenance facility is a special shop structure to house material and equipment for the service and maintenance of railroad locomotives and locomotive cranes. The facility is required where installations operate and maintain railroad equipment for the handling of supplies. In areas where it is practicable, the railroad equipment maintenance shop will be combined with the Automotive Vehicle Maintenance Shop and/or the Construction/Weight-Handling Equipment Shop and the number of repair bays (with pits) may be determined as follows:

Locomotives Supported	Repair Bays	Area SF
1-5	1	960
6-12	2	1,980
13 and over	3	2,880

21840-2 The numbers of additional bays are similarly determined from the above table.

## 218 45 INSTRUMENT CALIBRATION SHOP (SF)

**FAC: 2182****BFR Required: Y**

21845-1 **REPAIR.** This shop performs calibration, repair, and certification of all measurement instruments assigned to an activity. Space requirements are governed primarily by the number of pieces of equipment requiring calibration. The facility should be dust-free, temperature and humidity controlled and protected from electromagnetic interference. It is essential that the site selected for the location of this facility be free of ambient vibration to avoid interference with calibration operations. Normally the following spaces are included:

21845-1.1 **Calibration Laboratory**

21845-1.2 **Cleaning Room** is used for cleaning and drying equipment to be calibrated.

21845-1.3 **Utilities Room** is required so that utilities components can be isolated from the laboratory working area.

21845-1.4 **Storage Areas** for incoming and outgoing items, spare parts and equipment.

21845-1.5 **Administration Area.** The administration area provides office space, technical library, and file storage. Space allowances are planned in accordance with Category Code 610-10.

21845-2 **FOR SPECIFIC GUIDANCE.** See Joint Systems Commands publication Calibration Facility Requirements (NAVAIR 17-35 FR-02 NAVSEA OD 45842 and NAVELEX 0967-LP-465-8010) and Naval Shore Electronics Criteria (NAVELEX 0101, 114) calibration program.

## 218 50 BATTERY SHOP (SF)

**FAC: 2181****BFR Required: Y**

21850-1 A battery shop is required to service and charge batteries. As an example, typical batteries serviced at an air installation are lead-acid batteries used for ground support equipment (GSE) and nickel-cadmium and silver-zinc batteries for aircraft at the intermediate maintenance level. A shop is normally required at each Navy and Marine Corps air installation having approximately 75 or more aircraft. The gross area of the battery shop is 1,110 square feet. This shop size can accommodate a maximum workload of eight nickel-cadmium and 40 lead acid batteries per work shift. The shop

size should be modified for other workloads, with the major change being in the amount of space needed for charging benches.

**218 51 BATTERY RECHARGING SHOP (SF)**

**FAC: 2181**

**BFR Required: Y**

21851-1 This category code is for use at activities which have a requirement to recharge battery powered equipment such as forklift trucks used at supply centers. The requirement is a function of the number and size of the equipment being serviced and must be determined on an individual basis or in the case of forklift trucks, the following criteria may be used: 100 square feet per forklift which includes 40 square feet for the average vehicle itself and 60 square feet for aisle and workspace, based on a 1.5:1.0 ratio. In all instances, compliance must be maintained to OSHA regulations regarding the venting of hydrogen gas, floor drains, flush facilities, explosion proof wiring and lighting, etc.

**218 52 BATTERY RECHARGING SHED (SF)**

**FAC: 2185**

**BFR Required: Y**

21852-1 This category code captures battery charging structures/sheds at activities that have a requirement to recharge battery powered equipment such as forklifts and similar equipment. It supports either charging batteries outside of equipment or for temporarily supporting the requirement to charge housing equipment batteries.

**218 60 GROUND SUPPORT EQUIPMENT SHOP (SF)**

**FAC: 2181**

**BFR Required: Y**

21860-1 The intermediate level maintenance of aircraft ground support equipment (GSE) is performed in this shop. Ground support equipment, often referred to as yellow gear, includes such items as tow tractors, trucks, fork lifts, trailers, compressors, power generators, maintenance stands, jacks and other ground equipment which support aircraft operations.

The GSE shop requirement is based upon the average number of on-board aircraft and is sized in accordance with Table 21860-1 with the following modifications:

1. The areas shown in the table were developed for base loadings comprised mainly of VF, VA, VP, and VEW aircraft. Activities supporting primarily

helicopter or basic propeller training operations normally would not require a shop size greater than 12,500 SF regardless if the station loading exceeds 100 aircraft.

2. Stations which have a Fixed Point Utility System (FPUS) installed in the aircraft parking apron shall reduce the shop requirement by 640 square feet for each full increment of 75 aircraft spaces equipped with FPUS. See the example at the end of this section.
3. Stations having less than 40 aircraft shall individually justify a requirement for a GSE shop. Consideration shall be given to maintaining the GSE gear in the Automotive Vehicle Maintenance Shop (Category Code 214 20) prior to requesting a separate GSE shop.

**Table 21860-1  
Ground Support Equipment Shop**

Number of Aircraft	Shop Area (SF)
40-50	6,250
51-75	9,400
76-100	12,500
101-125	13,950
126-150	15,400
151-175	16,850
176-200	18,300
201-250	21,200
251-300	24,100

The above shop allowance includes work space for: battery shop, engine shop, paint shop, tire and wheel repair, jack repair and vehicle frame work. Supporting space for ready issue of parts, tool storage, classrooms, locker room, offices, and a mechanical equipment room are also included. A covered storage area for GSE gear is planned in conjunction with the GSE shop (see Category Code 218 61, Ground Support Equipment Holding Shed). A sample computation for a GSE shop is given below:

#### Example – GSE Shop

Given: Average on board aircraft – 179  
Fixed Point Utility System (FPUS) provided to 90 apron parking spaces

From Table 21860-1, shop area to support 179 aircraft equals 18,300 SF.

Reduction for FPUS:

90 apron spaces with FPUS divided by 75 = 1.2, use 1.0  
Reduce area by 1.0 x 640 SF  
Requirement equals 17,660 SF (18,300 – 640).



218 61 GROUND SUPPORT EQUIPMENT HOLDING SHED (SF)

**FAC: 2185**

**BFR Required: Y**

**21861-1 DEFINITION.** The ground support equipment (GSE) holding shed is planned in conjunction with the Category Code 218 60, Ground Support Equipment (GSE) Shop. The shed provides protective cover for GSE gear awaiting and undergoing intermediate level maintenance and is an integral part of the GSE Shop compound.

The GSE shed requirement is based upon the average number of on-board aircraft and is sized in accordance with Table 21861-1 with the following modifications:

1. The areas shown in the table were developed for base loadings comprised mainly of VF, VA, VP, and VEW aircraft. Activities supporting primarily helicopter or basic propeller training operations normally would not require a shop size greater than 19,500 SF regardless if the station loading exceeds 100 aircraft.
2. Stations which have a Fixed Point Utility System (FPUS) installed in the aircraft parking apron shall reduce the shop requirement by 640 square feet for each full increment of 75 aircraft spaces equipped with FPUS. See Category Code 218 60 for an application of a similar reduction to the GSE shop.

**Table 21861-1  
GSE Holding Shed**

Number of Aircraft	Shed Area (SF)
40-50	9,750
51-75	14,625
76-100	19,500
101-125	19,967
126-150	20,435
151-175	20,902
176-200	21,370
201-250	22,300
251-300	23,230

218 62 SHIPBOARD AIRCRAFT SUPPORT EQUIPMENT FACILITY (SF)  
**FAC: 2182**  
**BFR Required: Y**

21862-1 No criteria are currently available for this Category Code.

218 65 EQUIPMENT HOLDING SHED (For Category Code 218 20) (SF)  
**FAC: 2185**  
**BFR Required: Y**

21865-1 This facility is required in conjunction with Construction/Weight-Handling Equipment Shop, Category Code 218 20 for the purpose of protection of equipment awaiting repairs. The number and size of holding bays has to be determined on an individual basis and is dependent upon the type of equipment to be supported.

218 68 PRODUCTION EQUIPMENT MAINTENANCE SHOP (SF)  
**FAC: 2182**  
**BFR Required: Y**

21868-1 No criteria are currently available for this Category Code.

218 70 OFFICE EQUIPMENT/APPLIANCE REPAIR SHOP (SF)  
**FAC: 2182**  
**BFR Required: Y**

21870-1 Appropriate facilities may be provided to perform maintenance and repair of office equipment and small appliances. The space requirement for this facility is governed by the number of machines supported by the activity. See Table 21870-1.

**Table 21870-1. Space Allowance - Office Equipment/Appliance Repair Shop**

Number of Machines Supported	Gross SF Area
500	400
1,000	600
1,500	800
2,000	1,000
2,500	1,200
3,000	1,400
5,000	1,600

218 71 DENTAL EQUIPMENT MAINTENANCE BUILDING (SF)

**FAC: 2182**

**BFR Required: Y**

21871-1 No criteria are currently available for this Category Code.

218 77 REPAIR SHOP STORAGE (SF)

**FAC: 2182**

**BFR Required: Y**

21877-1 No criteria are currently available for this Category Code.

218 80 FIELD MAINTENANCE SHOP (GENERAL SUPPLY) (SF)

**FAC: 2182**

**BFR Required: Y**

21880-1 This field maintenance shop provides specialized work areas for Fleet Marine Force (FMF) units performing 3rd and 4th echelon maintenance on all items of general supply equipment. This function is performed primarily by the General Supply Maintenance Company, Maintenance Battalion, of the Force Service Regiment. The shop space includes administrative and storage space for tools, parts, and maintenance float equipment.

21880-2 For other field maintenance functions see Category Codes 214 53, 215 60, and 217 30.

21880-3 Conduct an engineering study to determine requirements.

218 90 AVIATION SUPPORT EQUIPMENT SHOP (NALC) (SF)

**FAC: 2182**

**BFR Required: Y**

21890-1 No criteria are currently available for this Category Code.

218 91 MOBILE VAN SHOP (NALC) (SF)

**FAC: 2181**

**BFR Required: Y**

21891-1 No criteria are currently available for this Category Code.

218 92 AVIATION SUPPORT / FEEDER SHOP (NALC) (SF)

**FAC: 2182**

**BFR Required: Y**

21892-1 No criteria are currently available for this Category Code.

## **219 MAINTENANCE - INSTALLATION, REPAIR AND OPERATION**

219-1 This basic category includes maintenance shops for repair and overhaul of installation facilities (public works and public utilities), including installed shop and other equipment, and utility distribution systems, used in support of maintenance operations at military and/or industrial installations. The maintenance and repair of vehicles and weight-handling and construction equipment, utility plant, and maintenance shops are not included in this category. For the former, see Category Code series' 214 and 218, and the latter, see Category Code series 811.

219 10 PUBLIC WORKS SHOP (SF)

**FAC: 2191**

**BFR Required: Y**

NOTE: For shop planning in Public Work Centers, individual guidance will be provided by NAVFAC.

21910-1 This facility supports the Maintenance Division of the Public Works Department. This Division is responsible for management of the Preventive, Maintenance Inspection (PMI) program and is tasked to perform maintenance on:

21910-1.1 All buildings, grounds and ground structures.

21910-1.2 Utilities plants and distribution systems when requested by the Utilities Division.

21910-1.3 Heating, air-conditioning and refrigeration systems.

21910-1.4 Internal communications and alarm systems.

21910-1.5 Roads and trackage.

21910-2 This work includes repairs, alterations and new construction incident to maintenance; except work that may be accomplished by private contract. In addition the Maintenance Division is responsible for the following services:

21910-2.1 Respond to emergency and/or service work requests.

21910-2.2 Provide caretaking services.

21910-2.3 Provide upkeep to all grounds of the activity.

21910-2.4 Provide for solid waste collection.

21910-2.5 Provide pest control service.

21910-3 Certain Public Works Department functions are not performed at the Public Works Shop as defined for Category Code 219 10, such as:

21910-3.1 Administration when not in direct support of a maintenance shop. This includes offices for the Public Works Officer (PWO), Assistant PWO, Maintenance Control Division, Maintenance Division supervisor and staff, Engineering Division, Administrative Division and Housing Division.

21910-3.2 Work performed by the Utilities Division such as operating utilities plants and distribution systems.

21910-3.3 Maintenance and repair of automotive equipment.

21910-4 Facilities for these functions are categorized under the following Category Groups as appropriate: 610- Administration, 218- Maintenance—Facilities for Miscellaneous Procured Items and Equipment, 214- Maintenance—Tank, Automotive, and the applicable code groups in the 800 series – Utilities and Ground Improvements.

21910-5 The maximum allowable gross area for public works shops, including space for heating and mechanical equipment, is based on the number of military and civilian maintenance personnel permanently assigned to the maintenance organization. This does not include those personnel involved in functions not directly performed by the shop as outlined above. Table 21910-1 lists the gross area for the various sizes of maintenance shops including Category Code 219 20, Pavement and Grounds Equipments Shed and 219 25, Public Works Shops Expendable/Work-in-Process Store.

**Table 21910-1. Space Allowance - Public Works Shops\***

Shop Type	Total Maintenance Personnel	Gross Area (SF)*
A	10-30	8,700
B	31-50	12,100
C	51-100	16,700
D	101-150	21,100
E	151-300	28,300

Shop Type	Total Maintenance Personnel	Gross Area (SF)*
F	301-500	34,800
	Over 500	100 SF/Pers.

\* The areas indicated in Table 21910-1 represent the entire composite area for the Public Works Maintenance Shop. Included within these figures are the areas allocated for category codes 219 20, Pavement and Grounds Equipment Shed, Table 21920-1, and 219 25, Public Works Shops Expendable/Work-In-Process Store, Table 21925-1. The requirement for the last two codes must not be added to this code but rather are considered an integral part of it. The figures indicated in the tables for these two codes are provided as a guide as to how category code 219 10 may be subdivided. In the event the requirement for category codes 219 20 and 219 25 are less than indicated, it is not necessary to reduce the figures indicated in Table 21910-1 but rather, this difference in area may be used for other functions performed by this shop.

21910-6 The gross areas listed in Table 21910-1 provide for the following functions: (1) the woodworking shop, including furniture repair, packing, and crating, excluding the packing and crating in Category Code series' 441 and 442); (2) the electrical shop, refrigeration and air conditioning shop; (3) plumbing and heating shop; (4) metal work shop, including machine shop, sheet metal, iron work, welding, and blacksmith facilities; (5) paint shop; (6) routine maintenance and service shops, including custodial, preventive maintenance, refuse collection, insect and rodent control, road maintenance facilities, moving and rigging, and emergency service shops; (7) central tool issue, shop stores and shop toilets, and locker rooms, and (8) administrative spaces in direct support to shop operations, corridors, and necessary service space directly related to the shop. If other than the foregoing functions are required, space may be appropriately increased if justifications are documented.

219 20 PAVEMENT AND GROUNDS EQUIPMENT SHED (SF)  
**FAC: 4422**  
**BFR Required: N**

21920-1 The pavement and grounds equipment shop will provide holding space and minor maintenance space for tractors, lawnmowers, snowplows, and other miscellaneous equipment used for roads and ground maintenance. This shop can be independent of the Public Works Maintenance Shop (Category Code 219 10) but is related for space allowances to the corresponding PW shop type. The gross square foot allowances on Table 21920-1 are provided for planning guidance only and are not additive to the Public Works shop allowances. See footnote to Table 21910-1.

**Table 21920-1. Space Allowance - Pavement and Grounds Equipment Shop**

Shop Type	Gross Area (SF)
A	525
B	700
C	850
D	1,100
E	1,800
F	2,200

219 25 PUBLIC WORKS SHOPS EXPENDABLE/WORK-IN-PROCESS STORE  
(SF)

**FAC: 2191**

**BFR Required: N**

21925-1 The public works shops expendable/work-in-process store holds the ready-issue items for public works daily maintenance, job order materials for the maintenance of station facilities and materials that are considered critical items for emergencies/service. It is independent of the General Supply Storage (Category Code 441 10). The shop can also be independent of the Public Works Shop (Category Code 219 10) but is related for space allowances to the corresponding PW shop type. See Table 21925-1. The gross square foot allowances on Table 21925-1 are provided for planning guidance only and are not additive to the Public Works shop allowances. See footnote to Table 21910-1.

**Table 21925-1. Space Allowances - Public Works Shop Store**

Shop Type	Gross Area (SF)
A	650
B	1,000
C	1,100
D	1,400
E	2,200
F	2,500

219 30 PAINTING AND RELATED OPERATIONS BUILDING (SF)

**FAC: 2191**

**BFR Required: Y**

21930-1 The function of the painting and related operations building is to provide space for painting and other operations which may not be functionally compatible or hazardous to the building or types of operation conducted in the public works shop, Category Code 219 10. This facility is considered as an integral part of Category Code 219 10 but may, in some instances, be a separate building if safety or functional requirements so dictate. However, in all cases, the area allocated for this facility must be considered as part of the area for the corresponding shop types listed in Table 21910-1 and must not be considered as an additional requirement.

219 31 PAINTING AND RELATED OPERATIONS STRUCTURE (EA)

**FAC: 2192**

**BFR Required: N**

21931-1 The painting and related operations structure is a facility used for painting and those operations which are not suitable to be carried on in Category Code 219 30, Painting and Related Operations Building. This code may include structures like a sandblast scaffold, paint spray booth, preservation dip tank, pickling tank, sandhopper, sandblasting facilities, open paint canopy, sand handling bin, etc. There are no specific planning criteria for these structures; each requirement must be individually justified.

219 40 SEWAGE HOSE STORAGE FACILITY (EA)

**FAC: 2192**

**BFR Required: N**

21940-1 This Category Code is for inventory purposes only.

219 77 PUBLIC WORKS MAINTENANCE STORAGE (READY ISSUE/SHOP STORES/MISC.) (SF)

**FAC: 2191**

**BFR Required: Y**

21977-1 This facility is a general warehouse for the storage of items and materials required for the maintenance of station buildings and grounds. It is independent of the ready-issue storage facilities required in direct support of the public works shops (use Category Code 219 25).



21977-2 Shed storage space is required to provide covered storage for certain items of equipment and supplies needed for base operation and maintenance, which do not require regular warehouse storage, yet must be protected from the weather. Table 21977-1 may be used to determine covered storage requirements for various sizes of public works facilities.

**Table 21977-1. Public Works Storage Areas**

Shop Type	Gross SF Area	
	Covered	Shed
A	3,400	2,300
B	3,400	2,300
C	3,400	2,300
D	6,000	4,000
E	12,500	8,300
F	19,200	12,800

NOTE: For Public Works Storage supporting PW shops larger than type F, add the following areas for each maintenance craftsman over 500: covered 40 SF; Shed - 25 SF

## 220 PRODUCTION

220-1 The production facility is part of the production system that processes raw materials, components and labor into finished goods.<sup>1</sup> Production facilities are typically “one-of-a-kind” therefore space requirements should be developed “from the ground up”; first for the individual workstations; then departmental requirements by summing the workstations within the department. Applying industrial engineering practices and methods would provide sufficient and accurate space requirements. Accurate future product demand forecasts are necessary so the facility can be sized for future growth. The facility should be sized for forecasted production growth 5 to 10 years beyond initial operating capability.<sup>2</sup>

This methodology applies for the following category codes:

221 10 AIRCRAFT ENGINE-ASSEMBLY PLANT (SF)

**FAC: 2211**

**BFR Required: Y**

221 20 AIRFRAME ASSEMBLY PLANT (SF)

**FAC: 2211**

**BFR Required: Y**

221 30 AIRCRAFT ACCESSORIES –ASSEMBLY PLANT (SF)

**FAC: 2211**

**BFR Required: Y**

222 10 MISSILE ASSEMBLY-PLANT (SF)

**FAC: 2221**

**BFR Required: Y**

222 20 MISSILE HANDLING LAUNCH EQUIPMENT (SF)

**FAC: 2221**

**BFR Required: Y**

223 10 FABRICATION & ASSEMBLY BUILDING (SF)

**FAC: 2231**

**BFR Required: Y**

223 30 SHIP-BUILDING DRYDOCKS (SF)

**FAC: 2233**

**BFR Required: Y**

224 10 COMBAT-VEHICLE ASSEMBLY PLANT (SF)

**FAC: 2241**

**BFR Required: Y**

224 20 AUTOMOTIVE-VEHICLE ASSEMBLY PLANT (SF)

**FAC: 2241**

**BFR Required: Y**

225 10 SMALL-ARMS PLANT (SF)

**FAC: 2251**

**BFR Required: Y**

225 20 LIGHT-GUN PLANT (SF)

**FAC: 2251**

**BFR Required: Y**

225 30 HEAVY-GUN PLANT (SF)

**FAC: 2251**

**BFR Required: Y**

225 40 HARBOR-PROTECTIVE-NET PLANT (SF)

**FAC: 2251**

**BFR Required: Y**

225 50 LAUNCHER & PROJECTOR PLANT (SF)

**FAC: 2251**

**BFR Required: Y**

225 60 ARMOR-PLATE PLANT (SF)

**FAC: 2251**

**BFR Required: Y**

226 10 BAG-CHARGE-FILLING PLANT (SF)

**FAC: 2261**

**BFR Required: Y**

226 15 CASE-FILLING PLANT (SF)

**FAC: 2261**

**BFR Required: Y**

226 20 CASE-OVERHAUL TANK-REPAIR FACILITY (SF)

**FAC: 2261**

**BFR Required: Y**

226 25 40MM-LOADING PLANT (SF)

**FAC: 2261**

**BFR Required: Y**

226 30 20MM-LOADING PLANT (SF)

**FAC: 2261**

**BFR Required: Y**

226 35 MAJOR-CALIBER PROJECTILE-LOADING PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 40 MEDIUM-CALIBER PROJECTILE-LOADING PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 45 LARGE-CALIBER ROCKET-MOTOR LOADING PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 50 MEDIUM-CALIBER ROCKET-MOTOR-LOADING PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 55 CAST-HIGH-EXPLOSIVES FILLING PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 56 CAST-HIGH-EXPLOSIVES FILLING FACILITY (SF)  
**FAC: 2262**  
**BFR Required: N**

226 60 SPECIAL-WEAPONS PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 65 PROPELLANT & RELATED-CHEMICAL PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 66 PROPELLANT & RELATED-CHEMICAL FACILITY (SF)  
**FAC: 2262**  
**BFR Required: N**

226 70        READY-AMMUNITION BELTING PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 75        UNDERWATER DEMOLITION EQUIPMENT PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 80        AMMUNITION-LOADING PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 81        DEMILITARIZATION BUILDING (SF)  
**FAC: 2264**  
**BFR Required: Y**

226 82        DEMILITARIZATION FACILITY (EA)  
**FAC: 2265**  
**BFR Required: N**

226 85        FUSE-ASSEMBLY PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 86        MINE-ASSEMBLY PLANT (SF)  
**FAC: 2261**  
**BFR Required: Y**

226 88        PYROTECHNIC PRODUCTION FACILITY (SF)  
**FAC: 2261**  
**BFR Required: Y**

227 10        RADIO & RADAR EQUIPMENT PLANT (SF)  
**FAC: 2271**  
**BFR Required: Y**

227 20 SONAR EQUIPMENT PLANT (SF)

**FAC: 2271**

**BFR Required: Y**

227 30 GUIDANCE EQUIPMENT PLANT (SF)

**FAC: 2271**

**BFR Required: Y**

227 35 PRINTED-CIRCUIT SHOP (SF)

**FAC: 2271**

**BFR Required: Y**

228 10 PARACHUTE & SURVIVAL-EQUIPMENT PLANT (SF)

**FAC: 2281**

**BFR Required: Y**

228 20 CONSTRUCTION EQUIPMENT PLANT (SF)

**FAC: 2281**

**BFR Required: Y**

228 30 RAILROAD EQUIPMENT PLANT (SF)

**FAC: 2281**

**BFR Required: Y**

228 35 OPHTHALMIC-SUPPORT BUILDING (SF)

**FAC: 5302**

**BFR Required: Y**

229 10 ASPHALT PLANT (EA)

**FAC: 2291**

**BFR Required: Y**

229 20 CONCRETE-BATCHING PLANT (EA)

**FAC: 2291**

**BFR Required: Y**

229 30      ROCK-CRUSHER PLANT (EA)

**FAC: 2291**

**BFR Required: Y**

229 35      POWDER-TANK/FLAKE-TANK STORAGE (BL)

**FAC: 8999**

**BFR Required: N**

229 50      PRINTING PLANT (SF)

**FAC: 6103**

**BFR Required: Y**

229 77      MAINTENANCE-PRODUCTION STORAGE-READY ISSUE ETC. (SF)

**FAC: 2281**

**BFR Required: Y**

229 80      CONTAINER ASSEMBLY BUILDING (SF)

**FAC: 2281**

**BFR Required: Y**

**FACILITIES CRITERIA (FC)**  
**FACILITY PLANNING FOR NAVY AND**  
**MARINE CORPS SHORE INSTALLATIONS**

**Series 300: RESEARCH, DEVELOPMENT, ACQUISITION, TEST, AND**  
**EVALUATION FACILITIES**

**Record of Changes:**

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of Change</b>
08 May 2018	300-6	Research, Development, Acquisition, Test And Evaluation Facilities	Updated criteria to meet minor changes that reference 131 Introductory criteria.
08 May 2018	310 33	Computation And Analysis Laboratory	Minor criteria rewording.
08 May 2018	317 10	Communications Systems Laboratory	Minor criteria rewording.
08 May 2018	317 25	Electrical, Electronics And Communication Systems Integration Laboratory	Minor criteria rewording.
08 May 2018	319 15	Telecommunications Distribution Facility	Minor criteria rewording.
14 August 2019	31105	RDAT&E Maintenance Hangar-Oh Space (High Bay)	Change title to: "RDAT&E Maintenance Hangar" and consolidated 31106 and 31107 into 31105.
14 August 2019	31106	RDAT&E Maintenance Hangar - 01 Space (Crew And Equipment)	Deleted CCN
14 August 2019	31107	RDAT&E Maintenance Hangar - 02 Space (Administrative)	Deleted CCN
July 2020	31013	Chemistry and Toxicology Laboratory	Description revised to remove the word "nuclear", as per OSD direction.
July 2020	31019	Physics Laboratory	Description revised to remove the word "nuclear", as per OSD direction.
July 2020	31815	Propulsion Fuel Laboratory	Description revised to remove the word "nuclear", as per OSD direction.
2 Mar 2023	300 Series	UFC 2-000-05N	Change UFC 2-000-05N to FC 2-000-05N document due to the fact that this planning criteria is not unified among the other DoD services.



**SERIES 300**  
**RESEARCH, DEVELOPMENT, ACQUISITION,**  
**TEST, AND EVALUATION FACILITIES**

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## **300 RESEARCH, DEVELOPMENT, ACQUISITION, TEST AND EVALUATION FACILITIES**

### **300-1 INTRODUCTION**

Research, development, acquisition, test and evaluation facilities include the buildings and other scientific structures and facilities used directly in theoretical and/or applied research, development, acquisition, test and evaluation operations. Category code groups pertaining to these facilities are:

- 300-1.1 **Category Code 310 through 321.** Research, development, acquisition, test and evaluation buildings
- 300-1.2 **Category Codes 371 and 390.** Research, development, acquisition, test and evaluation structures

Associated facilities assigned function in support of research, development, acquisition, test and evaluation are assigned appropriate codes such as Category Code series 200 for normal maintenance, repair and overhaul purposes; Category Code series 400 for warehouse, as opposed to storage functions; Category Code series 600 for administrative facilities; Category Code series 800 for utilities, and Category Code series 900 for real estate.

### **300-2 CATEGORY CODE DESIGNATION.**

After a determination is made of the gross floor/building area, a specific category can be assigned to the total space, based on the primary use for the facility. As a general guideline, offices and support areas which are directly related to a particular type of research activity carry the same category code as the laboratory areas themselves.

### **300-3 DEFINITION OF TERMS**

The following definitions of terms are used in the research criteria:

- 300-3.1 **Gross Floor/Building Area.** The total areas of all floors, measured between the exterior faces of outside walls. It includes full areas of basements, on-grade and above grade floors, service and equipment rooms, boiler plants and heater rooms, mezzanines, penthouses, enclosed passages and raised covered platforms. Excluded is all enclosed space with an average ceiling height of less than seven feet.
- 300-3.2 **Net Floor Area.** This is total gross floor area, less space taken up by outside walls, stair towers, elevator shafts, interior partitions, toilets, basements unsuited for specific use, permanent hallways, elevator

machinery and machinery or equipment used for heating and/or ventilating the building, and NMCI/telecomm room servers and ducts. The net floor area does include special equipment bays peculiar to a particular laboratory function.

300-3.3 **Prime Unit Generator.** A special object (e.g., tow tank, wind tunnel, environmental chamber, multi-axis rate table) which tends to have the room built around it, rather than fitting into an existing room. Prime unit generators usually require "high bay" areas and often have overhead cranes or other heavy handling equipment associated with them.

300-3.4 **NTG Factor** (net-to-gross conversion factor) That factor which is used to convert a net floor area to a gross floor/building area (net floor area x NTG factor = gross floor/building area).

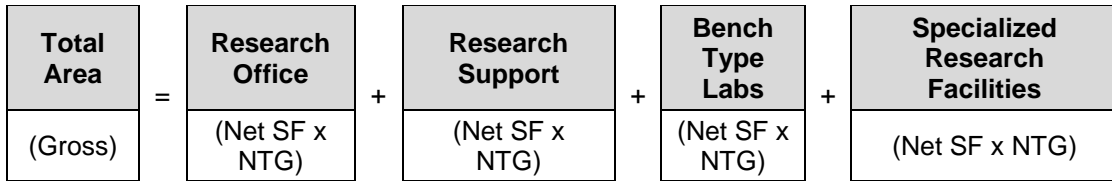
## 300-4 OVERALL METHODOLOGY

The basic problem in planning any research facility is the same: how to meet an existing need while at the same time providing for flexibility and growth. Research ranges from microscopic investigations to factory type testing set-ups. The methods described below provide a good prediction of the type and quantity of space that should be built to satisfy a specific program need, while at the same time allowing for flexibility to accommodate future R&D program.

300-4.1 In approaching any research facility planning project, it is advisable to break down the facility requirements into basic functional components. These components consist of:

- Research Offices
- Research Support
- Bench Type Labs
- Specialized Research Facilities

300-4.2 Not all of these components will be present in all research facilities. To arrive at total requirements for a facility, each of the components which are present should be looked at separately, using the appropriate method described in succeeding paragraphs. Net floor areas should be developed first for each component, and gross floor/building areas calculated for each by multiplying the net areas by the appropriate NTG conversion factor. The total space requirement for the research facility is obtained by adding the gross floor/building areas for each of the components, as diagrammed below:



300-4.3 There are three basic methods for developing and justifying net floor areas for research facilities. These consist of:

300-4.3.1 **Architectural Method** - This method consists of the development of scaled floor plans which depict a layout of equipment items within a required “envelope” of space. Such layouts should show the equipment as it should be placed within the space, which may not necessarily correspond to the manner in which such space is actually arranged in existing facilities. Such layouts should strive to be as efficient as possible.

300-4.3.2 **Industrial Method** - This method consists of identifying in a tabular format the net floor area required for each item of required equipment. When this method is used, the table should include three columns of information: (a) name of equipment item; (b) actual floor area occupied by the item, i.e., the size of its “footprint”; (c) size of the required working area within which the item sits, which permits all normal operations associated with the equipment as well as required services access to all sides. The sum of all the areas shown in item (c) will be the total net floor area for the space as a whole, and is equivalent to the “envelope” which would be shown graphically if the architectural method were used.

**Note: the Introduction of category code 131 provides requirements for various types of workstations and for equipment mounted in racks. Table 131 provides requirements for typical equipment found in offices and labs.**

300-4.3.3 **Use of Criteria** - For many types of facilities, approved rules of thumb (criteria) may be used to generate net floor areas. These are identified in terms of space per person, space per module, etc., and have been incorporated wherever possible into the P-80 guidance. Use of criteria generally requires less time and effort than either of the other methods.

300-4.3.4 In developing requirements for research facilities, any of the above methods may be used or a combination of these methods to develop the net floor areas for each functional component of the research facility.

## 300-5 OVERALL METHODOLOGY: RECOMMENDED PROCEDURES BY FUNCTIONAL COMPONENT

300-5.1 **Research Office.** Net floor areas for office spaces should be calculated by utilizing the criteria and guidance contained in Category Code 610 10. Gross floor/building areas should be developed using the NTG factors shown under this code. In utilizing the criteria, care must be taken to identify by administrative component, which personnel require office type space.

300-5.2 **Research Support.** The term “research support” is used to include lunch/locker spaces, libraries, auditoriums, etc., which may be required in direct support of an RDAT&E function. Studies have shown that space requirements for these types of space are similar, whether in support of a laboratory or other Navy uses. Therefore, the appropriate criteria may be used to calculate the requirements. If these criteria are to be used, refer to the appropriate category codes for guidance.

Examples of such codes are:

Installation Restaurant	Category Code 740 26
Academic Instruction Building	Category Code 171 10
Applied Instruction Building	Category Code 171 20
Auditorium	Category Code 171 25

Storage requirements are included in bench type labs or these requirements can be identified with Category Codes outside of the 300 series (Category Code 610 77 Admin storage or 171 77 Training Material Storage, etc.).

Net to gross conversion factors to be used for research support spaces are the same as for research offices.

300-5.3 **Bench Type Labs.** The bench lab component of research facilities tends (if present) to be organized into repetitive modules. Because of the nature of research, one scientist may share a laboratory module with another scientist, or in some instances, one scientist may have a need for two or more dedicated labs. Note: photographic darkrooms and control rooms are treated as bench labs, not as support space.

The basic laboratory module that is most adaptable to various types of research and which also works well within modern structural systems is 11.5 x 24 feet in size. This design allocates 276 square feet for net floor area per laboratory module.

The net to gross conversion factor to be used for bench type laboratories contains a built-in allowance for storage space, and laboratory support shop space. These are as follows:

For buildings supported by a central heating/cooling plant	1.35
For buildings containing their own HVAC equipment	1.65

300-5.4 **Specialized Research Facilities.** Specialized research facilities can be subdivided into three types: (1) Large set-ups of bench lab type activities which are too big to fit into a single bench lab module; (2) Systems Simulation including data processing laboratories, and (3) One-of-a-kind facilities such as tow tanks, environmental chambers, and wind tunnels.

300-5.5 **Large Set-Ups.** Large Set-Ups of relatively small and ordinary laboratory items arranged into a combination too large to fit into a single laboratory module, space allocation should be in multiples of a single 276 square foot bench lab module. These multiples usually range from 1 to 4 modules, only rarely exceeding 4 modules is size.

Net to gross conversion factors for large set-ups are the same as for bench labs spaces, and contain built-in allowances for storage and shop space. NTG factors to be used for large set-up spaces are as follows:

For buildings supported by a central heating/cooling plant	1.35
For buildings containing their own HVAC equipment	1.65

300-5.6 **Systems Simulation Facilities.** Allow 28 square feet of net floor area for each data processing unit such as communication hubs, data transmitters/receivers, display sets, or cryptographic modules or console. Do not count supplemental air handlers or programmers' desks—allowance for these is already included in the 28 square foot module.

Specialized equipment associated with the data processing equipment is treated as one-of-a-kind equipment (see below).

The Introduction of Category Code series 131 provides requirements for various types of workstations and for equipment mounted in racks. Table 131 provides requirements for typical equipment found in offices and labs.

NTG factors to be used for system simulation facilities are as follows:

For buildings supported by a central heating/cooling plant	1.35
For buildings containing their own HVAC equipment	1.65



300-5.7 **One-of-a-Kind Facilities.** One-of-a-kind facilities are built to house large and unique equipment such as wind tunnels, flow channels, shaker tables, environmental chambers, autoclaves, etc. A method for allocating space for one-of-a-kind facilities involves identifying the “Prime Unit Generator”. The prime unit generator is the item or assemblage of equipment which is the primary justification for the facility. Because of the specialized nature of these items, (which can be as small as a 6’ diameter pressure vessel, or as large as a 20 x 30 x 50 foot space shuttle avionics test fixture) it is necessary to have some special rules for defining prime unit generators. These rules include the following:

- Internal wind tunnels (where the entire tunnel is contained in a large room): Include compressors and/or suckers or reservoir vessels inside the building along with the tunnel tube itself.
- External wind tunnels (where most of the tube is outside and only a working chamber is housed inside the building): Do not include any mechanism which is outside the building. Do include the entire working chamber, even if one wall of the chamber constitutes or is in contact with the outside wall of the building.
- Tow tanks/flow channels/turning basins: Include in the prime unit generator all fundamentally necessary equipment which is inside the building and essential to the operation of the tank, channel, etc. Examples are pumps with flow channels, and wave making mechanisms with turning basins.
- Irradiation equipment including X-ray: Include as a part of the prime unit generator power generation equipment, (as with wind tunnels), flow channels, etc. For track mounted units, include the entire track as part of the prime unit generator. For remote controlled units operating in a shielded room, treat the room only as a prime unit generator, and the controls as bench lab if part of a larger building. If the controls are a freestanding building, the controls are considered a control console as described in the following paragraph.
- Control consoles: If freestanding in an otherwise open area, add 4 feet or clearance to working side and use the bench lab NTG factor. If in a separate room devoted exclusively to the control function, treat the entire room as a bench laboratory.

- Internal aisles and walk space in specialized research facility areas, and within bench labs accounted for in the NTG factor.
- General case. For RDAT&E equipment and installations not specifically discussed above, treat the primary functional unit, and any unique “custom tailored” ancillaries as the prime unit generator. Other support items of an off-the-shelf nature are not counted as part of the prime unit generator but allowed for in the NTG factor.

After the footprint (floor plan area) of the prime unit generator is identified, a 6-foot working clearance is provided on all sides. For irregular shaped items some smoothing of the outline should be allowed to simplify calculation.

Note that the 6-foot working clearance is a theoretical space allocation tool, not intended to reflect realistic working requirements. In cases where the equipment is close to a building wall, the 6-foot clearance may extend outside the building wall, but is still counted in determining the required net floor area.

The total area of the prime unit generator and its 6-foot working clearance is called the “Working Net” for that item.

The net to gross conversion factor applied to the working net of one-of-a-kind facilities depends upon the type of heating service provided to the building:

For buildings supported by a central heating/cooling plant	1.5
For buildings containing their own HVAC equipment	2.2

As an alternative to the above procedure, a scaled floor plan (Architectural Method) may be developed and provided as justification for the space requirement.

**300-5.8 Other.** Other research, development, testing, and evaluation facilities that are required but are not contained within a facility may also be required. These types of facilities may include testing ranges, outdoor testing or evaluation staging areas, or outdoor equipment laydown areas. An Engineering Analysis shall be provided to justify this type of facility.

## 300-6 SUMMARY OF RECOMMENDED PROCEDURES

For convenience, a brief summary is provided:

- **Offices** - Use criteria for Category Code 610 10.
- **Research Support** - Use criteria for Category Code 610 10
- **Bench Labs** - Use 276 square foot per lab. Treat darkrooms and control rooms as bench lab space. The NTG factor includes allowance for storage and direct shops support and varies with the type of building heating system.
- **Specialized Research Facilities** –
  - a. Large Set-Ups: Use multiple of bench lab module, same NTG factors as for bench labs.
  - b. Systems Simulation: Use 28 square foot module for each piece of data processing equipment. Add area for any specialized equipment (which is treated as one-of-a-kind equipment). Refer to Table 131-4 for lab equipment other than data processing equipment. The NTG factor equals 1.35 or 1.65, depending on the type of building heating system. If the facility requires back up requirements associated with Tier I-IV communications facilities, refer to 131 Introductory series NTG factors.
  - c. One-of-a-kind facilities: Identify prime unit generator. Add 6 foot working space to obtain working net. The NTG factor equals 1.5 or 2.2 depending on the type of building heating system.
  - d. Other: Use engineering analysis is to calculate the requirement for testing ranges, outdoor staging areas, outdoor equipment laydown areas, etc.

## 310 SCIENCE LABORATORIES

310-1 **DEFINITION.** Buildings used directly in theoretical or applied research, development and testing operations related to basic research such as chemistry, materials, medical, biological, sonic, physics, geophysics, etc.

**310 11      ASTRONOMY & ASTROPHYSICS LABORATORY (SF)****FAC: 3101****BFR Required: Y**

31011-1      **DEFINITION.** A facility required to support the investigation of radio astronomy equipment, satellite research, and development for navigational and communication programs. The facility is also utilized in conducting research and development in the fields of atmospheric physics, astrophysics in radio, radar and meteor astronomy, upper air physics, rocket astronomy, solar spectroscopy, and cosmic radiation, etc.

**310 13      CHEMISTRY AND TOXICOLOGY LABORATORY (SF)****FAC: 3101****BFR Required: Y**

31013-1      **DEFINITION.** The facility required to support the conducting of research, development, test and evaluation in the areas of physical, organic, inorganic, and biological chemistry, directed towards problems concerning fuels, lubricants, corrosion, protective coatings, electrochemistry, submarine atmosphere purification, protection against biological and chemical warfare agents, polymers, molecular structure, and related programs. This facility is further utilized to support the application of chemicals to explosives, propellants, pyrotechnics, etc., and the effects of the chemistry of the ocean as it affects acoustic absorption, sound speed, thermocline and water mass identification.

**310 15      MATERIALS LABORATORY (SF)****FAC: 3101****BFR Required: Y**

31015-1      **DEFINITION.** This facility is used for research, development, test and evaluation of static, pneumatic non-destructive as well as destructive testing of components and assemblies for Navy weapons, vehicles, engines, ships and aircraft. Includes testing such as Zygló, ultra violet light, sonic, X-ray, magna-flux and other techniques for accomplishing non-destructive testing of metals, plastics, etc.

31015-2      **USAGE.** This facility also supports research in the areas of physical, mechanical, chemical and structural metallurgy directed towards marine corrosion, high temperature flow and fracture mechanics, irradiation effects on metals, fracture-safe design, and in developing materials for use in transducers, underwater structures, sensing devices, weapons ships and aircraft. Also supports the synthesizing, modifying, fabricating and studying of metallic and nonmetallic materials such as plastics, rubber, adhesives, ceramics, resins, but excluding explosives and propellants, with emphasis on resistance to unusual

conditions such as high and low temperatures, stresses, aerodynamic heating, etc.

### **310 17 OPTICS LABORATORY (SF)**

**FAC: 3101**

**BFR Required: Y**

31017-1 **DEFINITION.** This facility is used in conducting research, development, test and evaluation programs in quantum optics, optical propagation, laser physics, optical materials and optical warfare. The facility is also used in efforts directed at discovering and understanding the basic physical principles and mechanisms involved in optical devices and phenomena.

### **310 19 PHYSICS LABORATORY (SF)**

**FAC: 3101**

**BFR Required: Y**

31019-1 **DEFINITION.** This facility is used in research, development, test and evaluation studies in the applied science of matter and energy. It includes research in such areas as acoustics, mechanics, light, thermodynamics, electromagnetism, atomic physics, cryogenics, solid state physics, particle physics and plasma physics, etc.

### **310 21 RADIATION EFFECTS LABORATORY (SF)**

**FAC: 3101**

**BFR Required: Y**

31021-1 **DEFINITION.** This facility is used in conducting research, development, test and evaluation on radiation characteristics of various devices and their effect on performance of various systems in the air and in the ocean environment. The facility is also used in the study of effects of radiation on people and marine life (e.g., acoustic pollution, hearing damage, and radioactivity) and the accomplishment of studies to determine reliable methods for detecting radiation sources.

### **310 23 COMBINED RESEARCH LABORATORY (SF)**

**FAC: 3101**

**BFR Required: Y**

31023-1 **DEFINITION.** This facility is used for research, development, test and evaluation of naval systems which utilized several of the sciences in a combined system applied directly to a Fleet problem or area of RDAT&E. It is also used to support research, development, test and evaluation of naval systems which do not logically fit the other categories of RDAT&E.

### **310 25 BIOLOGICAL LABORATORY (SF)**

**FAC: 3101**

**BFR Required: Y**

31025-1 **DEFINITION.** This facility is used in research, development, test and evaluation in terrestrial and marine biology as related to structure capabilities, functioning habitat, health, growth environmental indicators, ecological relationships of living organisms and association of biological phenomenon to man's existence and operations in the land, ocean and space environment. The facility also can include research in microbiology and environmental biology and the life process or characteristic phenomena of any group.

### **310 27 ENVIRONMENTAL LABORATORY (SF)**

**FAC: 3101**

**BFR Required: Y**

31027-1 **DEFINITION.** This facility is used to support the research, development, test and evaluation of instrumentation and computer systems for measurement and analysis of the evaluation of environmental effects on various equipment, weapons systems, facilities, etc. The principle thrust of research and development in this area is in the fields of mechanical shock, vibration, pressure, and in the natural environments of temperature, humidity, corrosion, etc. Also includes working mock-ups of environmental studies relating man to the test environment.

### **310 29 ANIMAL APPLICATIONS LABORATORY (SF)**

**FAC: 3101**

**BFR Required: Y**

31029-1 **DEFINITION.** This facility is used to support the research, development, test and evaluation on non-human animals in pure research and ocean support applications. This would include the use of whales and dolphins as trained deep sea divers, seals for shallow water tool recovery and dogs as sentries. It can also include research and development in application and knowledge of animal capabilities in sensing, homing and identification to improve the operation of man-made ocean devices. It provides veterinary medical support

for marine mammal projects including applied research on diagnosis, treatment, surgery, husbandry and nutrition.

### **310 31 MEDICAL LABORATORY (SF)**

**FAC: 3102**

**BFR Required: Y**

31031-1 **DEFINITION.** This facility is used in conducting research toward methodology for diagnosis, treatment, or prevention of disease or damage to the body or mind.

### **310 33 COMPUTATION AND ANALYSIS LABORATORY (SF)**

**FAC: 3101**

**BFR Required: Y**

31033-1 **DEFINITION.** This facility supports research, development, test and evaluation in the areas of information processing and data handling, especially when concerned with identification of conditions responsible for data configurations. This facility supports mathematical data analysis utilizing both digital and analog computers to research, develop, test and evaluate new naval systems from simulated and real time data.

31033-2 **FUNCTIONAL AREAS.** A Computation and Analysis Laboratory may contain the following functional areas: research offices, research support, bench type labs, and specialized research facilities. Please refer to the guidelines provided in the introduction of the 300 series Category Codes for RDATE&E to calculate the requirement.

### **310 37 OCEAN SCIENCES LABORATORY (SF)**

**FAC: 3101**

**BFR Required: Y**

31037-1 **DEFINITION.** This facility is used to accomplish research, development, test and evaluation in marine biosystems, environmental protection and management, development of analytical systems for evaluation of the ocean environment, studies of wave dynamics, current flow, thermoclines, chemical variances, bottom sampling, as well as development of new techniques and equipment to increase man's knowledge and utilization of the total ocean environment.

### **310 39 LEVEL III BIOSAFETY LABORATORY (SF)**

**FAC: 3103**

**BFR Required: Y**

31039-1 **DEFINITION.** This type of laboratory applies to clinical, diagnostic, and teaching, research, or production facilities for work involving indigenous or exotic agents that have the potential to transmit infection through the respiratory system, which may cause serious and potentially lethal infection. Biosafety Level III applies to Risk Group 3 agents that are associated with serious or lethal human disease for which preventive or therapeutic interventions may be available. Risk Group 3 agents are defined by the guidelines of "Biosafety in Microbiological and Biomedical Laboratories," US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health.

31039-2 **USAGE.** Laboratory facilities must be separated from other areas that are subject to unrestricted traffic flow within a building. If a laboratory is separated into different laboratories (zones), a sink must be provided for hand washing in each zone. Access to the laboratory will be restricted to entry by a series of two self-closing doors. A clothing change room (anteroom) may be included in the passageway between the two self-closing doors. An area for decontaminating all laboratory wastes should be planned in the facility, preferably within the laboratory (e.g., autoclave, chemical disinfection, incineration, or other validated decontamination method). The facility must also include an area for decontaminating large pieces of equipment to facilitate removal of the equipment from the laboratory.

**310 40 LEVEL IV BIOSAFETY LABORATORY (SF)****FAC: 3104****BFR Required: Y**

31040-1 **DEFINITION.** This type of laboratory is associated with work on dangerous and exotic agents that pose a high individual risk of life-threatening disease, aerosol transmission, or related agent with unknown risk of transmission. Biosafety Level IV applies to Risk Group 4 agents that are likely to cause serious or lethal human disease for which preventive or therapeutic interventions are not usually available. Risk Group 4 agents are defined by the guidelines of "Biosafety in Microbiological and Biomedical Laboratories," US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health.

31040-2 **USAGE.** A Laboratory facility consists of either a separate building or a clearly demarcated and isolated zone within a building. Rooms in the facility must be arranged to ensure exit by sequential passage through the chemical shower, inner (dirty) change room, personal shower, and outer (clean) changing area. A chemical shower must be provided to decontaminate the surface of the



positive pressure suit before the worker leaves the laboratory. Sinks inside the suit laboratory should be placed near procedure areas and contain traps and be connected to the wastewater decontamination system. An eyewash station must be readily available in the laboratory area for use during maintenance and repair activities.

## 311 AIRCRAFT

311-1 Buildings used directly in the research, development and testing of air frames and related assemblies and spares, and other aircraft equipment.

### 311 05 RDAT&E MAINTENANCE HANGAR (SQ. M. / SF)

FAC: 2111

BFR Required: Y

Catcodes 311 06 and 311 07 are now included in catcode 311 05

### 311 06 RDAT&E MAINTENANCE HANGAR – 01 SPACE (CREW AND EQUIPMENT) (SQ. M. / SF)

Catcode 311 06 is now contained in catcode 311 05

### 311 07 RDAT&E MAINTENANCE HANGAR – 02 SPACE (ADMINISTRATIVE) (SQ. M. / SF)

Catcode 311 07 is now contained in catcode 311 05

31105/06/07-1 **DEFINITION.** This criteria is currently in development and will be posted upon completion.

### 311 10 AIRCRAFT FLIGHT AND NAVIGATIONAL EQUIPMENT LABORATORY (SF)

FAC: 3111

BFR Required: Y

31110-1 **DEFINITION.** This facility is utilized in conducting research, development, test and evaluation of aerodynamic design of aircraft and weapons systems and navigational systems. Equipment is evaluated to assure optimum flight performance, stability, and control characteristics and on airborne equipment. The facility is also used in conducting RDAT&E in aerodynamic science in support of advanced aircraft and weapon concepts. The facility can also be an operating test facility for air navigation systems, equipment and

component acceptance testing, design and performance analysis, and diagnostic and analytic evaluation to ensure proper system equipment and component function.

## **311 20 AIRCRAFT GROUND SUPPORT EQUIPMENT LABORATORY (SF)**

**FAC: 3111**

**BFR Required: Y**

31120-1 **DEFINITION.** This facility is used to research, development, test and evaluation of aircraft ground support equipment, systems and techniques for the takeoff, recovery, maintenance, and test of aircraft. The facility is used to test and evaluate ground support equipment for aircraft armament and weapons, aircraft handling, servicing and inspection equipment and aircraft avionics equipment. This does not include missile and missile system ground handling equipment.

## **311 25 AIRCRAFT SYSTEMS INTEGRATION LABORATORY (SF)**

**FAC: 3111**

**BFR Required: Y**

31125-1 **DEFINITION.** This facility is used for research, development, test and evaluation of various groupings and collections of interacting aircraft systems such as the effects of airframe, structure, flight control, electrical, environmental control, fuel, hydraulic, mechanical, pneumatic, propulsion, gun, life support and related ground support systems on ECM, air to air missile launch, etc. This does not include work on aircraft engine design characteristics.

## **312 MISSILE AND SPACE**

312-1 Buildings used directly in the research, development and testing of missiles, missile system, related ground handling, and launching equipment, and other aerospace equipment.

### **312 10 GUIDED MISSILE LABORATORY (SF)**

**FAC: 3121**

**BFR Required: Y**

31210-1 **DEFINITION.** This facility is used in support of research, development, test and evaluation of advance simulation, instrumentation,

environmental test techniques and improved serviceability and reliability characteristics of guided missile weapon systems. It includes assembly, disassembly, test modification and analysis of test firing results of guided missiles.

31210-2 **USAGE.** This facility also may support research, development, test and evaluation of missile navigation systems and related equipment. It includes design and testing of guidance and control systems for guided missiles and launch and arming systems for ballistic missiles, component testing, error diagnosis, and performance analysis as applied to missiles and missile systems.

### **312 20 MISSILE SUPPORT EQUIPMENT LABORATORY (SF)**

**FAC: 3121**

**BFR Required: Y**

31220-1 **DEFINITION.** This facility is used for research, development, test and evaluation of equipment and techniques for the launching, recovery, maintenance, transport and testing of missiles and guided missile support equipment.

### **312 25 SPACECRAFT/SATELLITE LABORATORY (SF)**

**FAC: 3121**

**BFR Required: Y**

31225-1 **DEFINITION.** This facility supports research, development, test and evaluation of spacecraft, satellites or components of each not otherwise classified as a missile weapon system. This facility would include related ground support/launching equipment.

### **312 30 MISSILE SYSTEMS INTEGRATION LABORATORY (SF)**

**FAC: 3121**

**BFR Required: Y**

31230-1 **DEFINITION.** This facility is used for research, development, test and evaluation of related and interconnected systems that are necessary for launching, and in direct support of guided missile systems.

## **313 SHIP AND MARINE EQUIPMENT**

### **313 10 SHIP AND MARINE LABORATORY (SF)**

**FAC: 3131**

**BFR Required: Y**

31310-1 **DEFINITION.** This facility is used in conducting research, development, test and evaluation on ships, by use of models in high and low speed tow tanks, maneuvering and seakeeping basins, water tunnels, circulating water channels, fluid phenomenon basins, etc. The facility is also used in conducting fundamental and applied research related to the efficiency of ship structures, other marine vessels, including tracked amphibious vehicles, and the development of methods to assist the effect of static and dynamic loads imposed by submergence depth, wave and submarine structures.

31310-2 **USAGE.** The facility is also an operating test facility for ship and marine vessel navigation systems, equipment and component acceptance testing, design and performance analysis and diagnostic and analytic evaluation to ensure proper system equipment and component function.

**313 20 SHIPS AND MARINE EQUIPMENT LABORATORY (SF)****FAC: 3131****BFR Required: Y**

31320-1 **DEFINITION.** This facility is used to conduct research, development, test and evaluation of ships and marine support requirement. This includes repair and maintenance equipment as well as equipment for direct support and operation of ships and marine vessels such as periscopes, towed arrays, etc. It is further utilized to support the study of methods for designing shipboard and other marine equipment for resistance to service loads, attacks, and combat reliability.

**313 25 SHIPS AND MARINE SYSTEMS INTEGRATION  
LABORATORY (SF)****FAC: 3131****BFR Required: Y**

31325-1 **DEFINITION.** This facility is used for research, development, test and evaluation of related and interconnected ships and marine systems such as the ship platform integrated with the weapons systems, communication systems, command and control systems, surveillance systems, navigation systems, etc. The facility would include mock-up facilities for establishing adaptability, compatibility and space requirements for both man and machine.

## **314 TANK AND AUTOMOTIVE**

### **314 10 GROUND TRANSPORTATION EQUIPMENT LABORATORY (SF)**

**FAC: 3141**

**BFR Required: Y**

31410-1 **DEFINITION.** This facility is used in conducting research, development, test and evaluation in the field of automotive design as applied to tanks, APC's, and related military automotive equipment. This facility is also used in conducting RDAT&E on ground equipment in direct support of tank and automotive equipment such as power units, mobile maintenance, test equipment, heavy handling, lifting equipment, etc.

## **315 WEAPONS AND WEAPON SYSTEMS**

315-1 RDAT&E facilities for guided missiles and related items are included under Category Code series 312.

### **315 10 AIRCRAFT WEAPON SYSTEMS LABORATORY (SF)**

**FAC: 3151**

**BFR Required: Y**

31510-1 **DEFINITION.** This facility supports the research, development, test and evaluation of aircraft weapon systems including projectiles, mines and bombs, and defensive countermeasures devices/weapons.

### **315 15 SHIP WEAPON SYSTEM LABORATORY (SF)**

**FAC: 3151**

**BFR Required: Y**

31515-1 **DEFINITION.** This facility is used for research, development, test and evaluation of weapons and weapon systems deployed from a surface ship. This would include guns, fire control, etc. This does not include aircraft or missile systems.

### **315 20 UNDERWATER WEAPON SYSTEM LABORATORY (SF)**

**FAC: 3151**

**BFR Required: Y**

31520-1 **DEFINITION.** This facility is used for research, development, test and evaluation of undersea weaponry such as mines and torpedoes. This would include submarine mounted guns but not submarine launched missiles. Key platform components include sonar, combat control, underwater submarine warfare (USW) weapons targets, unmanned underwater vehicles (UUVs), and fleet training systems.

An underwater weapon system laboratory typically includes the following areas:

- Research offices
- Electronic assembly
- Prototype and electronic repair
- Commercial-off-the-shelf (COTS) laboratory
- Technical library
- Conference room
- Reproduction
- Lounge
- Storage

The typical net-to-gross factor for such a facility is 1.45.

### **315 25 GROUND WEAPON SYSTEMS LABORATORY (SF)**

**FAC: 3151**

**BFR Required: Y**

31525-1 **DEFINITION.** This facility is used for research, development, test and evaluation of weaponry in use on or deployed from a ground base platform and would include small arms, automatic weapons, mortars, artillery, flame throwers, etc.

### **315 30 WEAPON SYSTEMS INTEGRATION LABORATORY (SF)**

**FAC: 3151**

**BFR Required: Y**

31530-1 **DEFINITION.** This facility is used to accomplish research, development, test and evaluation associated with the integration of weapon systems with the weapons platform and with other interfaces between other weapons systems, guidance systems, surveillance systems, etc.

## **316 AMMUNITION, EXPLOSIVES AND TOXICS**

### **316 10 AMMUNITION, EXPLOSIVES AND TOXICS LABORATORY (SF)**

**FAC: 3161**

**BFR Required: Y**

31610-1 **DEFINITION.** This facility is used to support the research, development, test and evaluation of ammunition, rockets, bombs, mines, grenades, torpedoes, depth charges, demolition materials, pyrotechnics, AT0 units, related chemicals, and their components and materials. This Category Code does not include facilities for guided missiles, guided bombs, or commercial type petroleum products.

## **317 ELECTRONIC, COMMUNICATION AND ELECTRICAL EQUIPMENT**

317-1 Buildings used directly in the research, development and testing of radio and radar equipment, signal equipment, radiation aids, electrical equipment and its controls, transmitting and receiving equipment, avionics equipment, sonar, and guided bombs.

### **317 10 COMMUNICATIONS SYSTEMS LABORATORY (SF)**

**FAC: 3171**

**BFR Required: Y**

31710-1 **DEFINITION.** This facility is used for conducting research, development, test and evaluation in the areas of radio communication, instrumentation, satellite communication, electromagnetic propagation, radio antennas, underwater sound systems, optical systems (infrared), etc.

31710-2 **FUNCTIONAL AREAS.** A Communications Systems Laboratory may contain the following functional areas: research offices, research support, bench type labs, and specialized research facilities. Please refer to the guidelines provided in the introduction of the 300 series Category Codes for RDAT&E to calculate the requirement.

**317 15 DETECTION SYSTEMS LABORATORY (SF)****FAC: 3171****BFR Required: Y**

31715-1 **DEFINITION.** This facility is used in conducting research, development, test and evaluation in basic physical phenomena of importance to radar, sonar, and related sensors, also the development of systems analysis and evaluation of the sensors used in satellites, ships, submarines, and aircraft, etc. It includes surveillance for detection, localization, identification and classification of surface, aerospace and sub-surface objects.

**317 20 ELECTRICAL AND ELECTRONICS SYSTEMS LABORATORY (SF)****FAC: 3171****BFR Required: Y**

31720-1 **DEFINITION.** This facility is used in conducting research, development, test and evaluation in the areas of electrical power and its control, magnetic fields and ship's control systems. Research in this area involves development of motors and generators, frequency converters, voltage and current control devices, and shipboard power distribution systems. In the magnetic fields, studies are conducted in the reduction of stray fields produced by naval equipment, methods of determining ship's magnetic signature and new concepts in degaussing systems.

31720-2 **USAGE.** This facility is also used in the fields of electronics and electromagnetic phenomena in support of components, subsystems, and systems in detection, communication, navigation, countermeasures, acoustics, electromagnetics, identification, and classification as they apply to naval ordnance, submarine weapons systems, surface ships and aircrafts.

**317 25 ELECTRICAL, ELECTRONICS AND COMMUNICATION SYSTEMS INTEGRATION LABORATORY (SF)****FAC: 3171****BFR Required: Y**

31725-1 **DEFINITION.** This facility is used to accomplish research, development, test and evaluation associated with the integration of related systems and subsystems of electrical, electronics and communications systems with the platform (air, sea, ground, etc.) upon which they will operate and verify interface consideration with other systems operating on the respective platform.



31725-2 **FUNCTIONAL AREAS.** An Electrical, Electronics, and Communications Systems Integration Laboratory may contain the following functional areas: research offices, research support, bench type labs, and specialized research facilities. Please refer to the guidelines provided in the introduction of the 300 series Category Codes for RDAT&E to calculate the requirement.

## **318 PROPULSION**

### **318 10 PROPULSION SYSTEMS LABORATORY (SF)**

**FAC: 3181**

**BFR Required: Y**

31810-1 **DEFINITION.** This facility is used to support research, development, test and evaluation of propulsion systems in order to determine operational capabilities and in studying the acoustics and electromagnetic noise effects on performance and efficiency of drive units.

### **318 15 PROPULSION FUEL LABORATORY (SF)**

**FAC: 3181**

**BFR Required: Y**

31815-1 **DEFINITION.** This facility is used to support research, development, test, and evaluation of propulsion fuels in order to maximize a propulsion system's operational characteristics. This facility would also support investigation into new fuels and propulsive energy systems.

## **319 MISCELLANEOUS ITEMS AND EQUIPMENT**

### **319 10 MISCELLANEOUS EQUIPMENT AND ITEMS LABORATORY (SF)**

**FAC: 3191**

**BFR Required: Y**

31910-1 **DEFINITION.** This facility supports research, development, test, and evaluation of miscellaneous military equipment such as landing mats, valves (e.g. safety, pressure reducing, fuel regulating), and hyperbaric facilities not appropriate in another category code.

### **319 15 RDAT&E STORAGE LABORATORY (SF)**

**FAC: 3191**

**BFR Required: Y**

31915-1 **DEFINITION.** This building is a storage facility for research, development, test, and evaluation equipment and materials directly related to RDAT&E programs.

31915-2 Storage facilities for equipment related to RDAT&E facilities will be provided only where it can be individually justified. There are no criteria for this type of facility. General information on normal stacking heights, SF per measurement ton requirements, and calculation methods are provided in the Category Code 440 series.

**319 20 CIVIL ENGINEERING LABORATORY (SF)****FAC: 3191****BFR Required: Y**

31920-1 **DEFINITION.** This facility is used to support research, development, test and evaluation in the area of civil engineering. This would include military type bridging, hand tools, construction equipment, construction techniques, on land, in and under the ocean.

**319 25 HUMAN FACTORS LABORATORY (SF)****FAC: 3191****BFR Required: Y**

31925-1 **DEFINITION.** This facility is used to determine the effects of wartime atmosphere and material on military personnel and non-combatants. This facility would also deal with man-man interfacing (morale, command control, and the like) and man-machine interfacing (console design, payload design, work area requirements, etc.)

**319 30 SURVIVAL EQUIPMENT AND CLOTHING LABORATORY (SF)****FAC: 3191****BFR Required: Y**

31930-1 **DEFINITION.** This facility supports research, development, test and evaluation of pilot's and sailor's need for special equipment, clothing and techniques for survival in various hostile environments.

**319 35 METROLOGY AND CALIBRATION LABORATORY (SF)****FAC: 3191****BFR Required: Y**

31935-1 **DEFINITION.** This facility will be used in direct support of research, development, test and evaluation programs where precise weights and measures are required in calibrating RDAT&E equipment. This facility would include the metrology and calibration equipment and space for calibrating applicable equipment.

**319 40 RANGE OPERATIONS AND INSTRUMENTATION LABORATORY (SF)****FAC: 3191****BFR Required: Y**

31940-1 **DEFINITION.** This facility is used in support of research, development, test and evaluation of range operations to include command center, communications, surveillance, instrumentation, data collection/reduction/display, etc.

**320 UNDERWATER EQUIPMENT****320 10 UNDERWATER EQUIPMENT LABORATORY (SF)****FAC: 3201****BFR Required: Y**

32010-1 This facility is used in conducting research development, test and evaluation of underwater acoustics, ship vibrations and various types of underwater devices to increase man's capabilities in the ocean.

32010-2 The facility is also used to support RDT&E in hydro-acoustics, structural acoustics, mechanical vibration and signal processing, and conducting acoustic and vibration trials and instrumentation devices for sound and vibration attenuation, the RDT&E of deep ocean tools, equipment and work systems as well as support equipment for divers, submersibles and marine systems of all types.

32010-3 This building supports the RDT&E of undersea navigational systems and related equipment. This would include component design, error diagnosis, and performance analysis for location sensing, direction control, and depth control for undersea vessels. It would include devices for manned and unmanned vehicles as well as divers' navigational equipment.

**320 20 UNDERWATER SYSTEMS INTEGRATION  
LABORATORY (SF)****FAC: 3201****BFR Required: Y**

32020-1 This facility will be used for research, development, test and evaluation of various interacting underwater systems, equipment, tools, techniques and operators working together in an underwater environment. The integration of several systems to accomplish a greater total effort will be accomplished in this facility.

**321 TECHNICAL SERVICES****321 10 TECHNICAL SERVICES LABORATORY (SF)****FAC: 3211****BFR Required: Y**

32110-1 Buildings used directly in RD&T manufacturing or reverse engineering of one-of-a-kind models and parts for systems or subsystems from wood, plastic, fiberglass and other materials by molding, casting, extruding and machining.

**371 RANGE FACILITIES**

371-1 Structures used directly in research, development and testing of small arms, artillery, weapons systems, avionics, protection equipment, shelters, etc.

**371 10 SCIENCE SYSTEMS RANGE FACILITY (EA)****FAC: 3712****BFR Required: N**

37110-1 Facilities used in the conduct of tests and evaluations of items identified under Category Code series 310.

**371 11 AIRCRAFT SYSTEMS RANGE FACILITY (EA)****FAC: 3712****BFR Required: N**

37111-1 Facilities used in the conduct of tests and evaluations of items identified under Category Code series 311.

**371 12 MISSILE AND SPACE SYSTEMS RANGE FACILITY (EA)**

**FAC: 3712**

**BFR Required: N**

37112-1 Facilities used in the conduct of tests and evaluations of items identified under Category Code series 312.

**371 13 SHIPS AND MARINE SYSTEMS RANGE FACILITY (EA)**

**FAC: 3712**

**BFR Required: N**

37113-1 Facilities used in the conduct of tests and evaluations of items identified under Category Code series 313.

**371 14 TANK AND AUTOMOTIVE SYSTEMS RANGE FACILITY (EA)**

**FAC: 3712**

**BFR Required: N**

37114-1 Facilities used in the conduct of tests and evaluations of items identified under Category Code series 314.

**371 15 WEAPONS AND WEAPON SYSTEMS RANGE FACILITY (EA)**

**FAC: 3712**

**BFR Required: N**

37115-1 Facilities used in the conduct of tests and evaluations of items identified under Category Code series 315.

**371 16 AMMUNITION, EXPLOSIVES AND TOXICS RANGE FACILITY (EA)**

**FAC: 3712**

**BFR Required: N**

37116-1 Facilities used in the conduct of tests and evaluations of items identified under Category Code series 316.

**371 17 ELECTRONIC, COMMUNICATION AND ELECTRICAL SYSTEMS RANGE FACILITY (EA)**

**FAC: 3712**

**BFR Required: N**

37117-1 Facilities used in the conduct of tests and evaluations of items identified under Category Code series 317.

**371 18 PROPULSION SYSTEMS RANGE FACILITY (EA)**

**FAC: 3712**

**BFR Required: N**

37118-1 Facilities used in the conduct of tests and evaluations of items identified under Category Code series 318.

**371 19 MISCELLANEOUS ITEMS AND EQUIPMENT RANGE FACILITY (EA)**

**FAC: 3712**

**BFR Required: N**

37119-1 Facilities used in the conduct of tests and evaluations of items identified under Category Code series 319.

**371 20 UNDERWATER SYSTEMS RANGE FACILITY (EA)**

**FAC: 3712**

**BFR Required: N**

37120-1 Facilities used in the conduct of tests and evaluations of items identified under Category Code series 320.

**390 RDT&E OTHER THAN BUILDINGS AND RANGE FACILITIES**

390-1 Scientific structures and facilities other than buildings used directly in theoretical or applied research, development, and test operations related to such items as test tracks, wind tunnels, etc. Do not include structures and buildings used for normal maintenance, repair, and overhaul purposes.

**390 10 SCIENCE SYSTEMS FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

39010-1 Facilities used in the conduct of research, development, test and evaluation of items identified under Category Code series 310.

**390 11 AIRCRAFT SYSTEMS FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

39011-1 Facilities used in the conduct of research, development, test and evaluation of items identified under Category Code series 311.

**390 12 MISSILE AND SPACE SYSTEMS FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

39012-1 Facilities used in the conduct of research, development, test and evaluation of items identified under Category Code series 312.

**390 13 SHIPS AND MARINE SYSTEMS FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

39013-1 Facilities used in the conduct of research, development, test and evaluation of items identified under Category Code series 313.

**390 14 TANK AND AUTOMOTIVE SYSTEMS FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

39014-1 Facilities used in the conduct of research, development, test and evaluation of items identified under Category Code series 314.

**390 15 WEAPONS AND WEAPONS SYSTEMS FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

39015-1 Facilities used in the conduct of research, development, test and evaluation of items identified under Category Code series 315.

**390 16 AMMUNITION, EXPLOSIVES AND TOXICS FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

39016-1 Facilities used in the conduct of research, development, test and evaluation of items identified under Category Code series 316.

**390 17 ELECTRONIC, COMMUNICATION AND ELECTRICAL SYSTEMS FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

39017-1 Facilities used in the conduct of research, development, test and evaluation of items identified under Category Code series 317.

**390 18 PROPULSION SYSTEMS FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

39018-1 Facilities used in the conduct of research, development, test and evaluation of items identified under the Category Code series 318.

**390 19 MISCELLANEOUS ITEMS AND EQUIPMENT FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

39019-1 Facilities used in the conduct of research, development, test and evaluation of items identified under the Category Code series 319.



**390 20 UNDERWATER SYSTEMS FACILITY (EA)**

**FAC: 3901**

**BFR Required: N**

39020-1 Facilities used in the conduct of research, development, test and evaluation of items identified under the Category Code series 320.

**FACILITIES CRITERIA (FC)**  
**FACILITY PLANNING FOR NAVY AND**  
**MARINE CORPS SHORE INSTALLATIONS**

**Series 400: Supply Facilities**

**Record of Changes:**

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of change</b>
Jan 2017	Section 420	Ammunition Storage	Complete revision of magazine sizing and siting criteria. Implementation of Magazine Storage and Requirements Calculator (MSRC).
Jan 2017	Section 421	Ammunition Storage Depot and Installation	Revisions to magazine category codes within 421 series.
Jan 2017	42112	Fuse And Detonator Magazine	Consolidated into CCN 42122 High Explosive Magazine. CCN deleted from iNFADS.
Jan 2017	42152	Smokeless Powder And Projectile Magazine	Consolidated into CCN 42122 High Explosive Magazine. CCN deleted from iNFADS.
Jan 2017	42172	Missile Magazine	Consolidated into CCN 42122 High Explosive Magazine. CCN deleted from iNFADS.
Jan 2017	NEW-Table 420-1	Various CCNs	Provides new list of CCNs within the UFC 2-000-05N that require explosive safety site approval.
June 2018	42511	Explosive Storage Site Pad	Added new CCN for site pads for non-RP ordnance storage.
Sep 2019	Section 420	Ammunition Storage	Updated to reflect 10-digit CODEX. Added new requirement for ordnance handling loading/offloading area for all new Earth Covered Magazines.
Sep 2019	41160	Liquefied Petroleum Gas Storage	FAC Code changed to 1244
Sep 2019	42182	Submarine Launched Ballistic Missile	FAC Code changed to 4211
July 2020	42510	Open Ammunition Storage Pad	FAC code changed to 8526
July 2020	42511	Explosive Storage Site Pad	FAC code changed to 8526; revised criteria verbiage.

Date	CCN #	CCN Title	Description of change
8 August 2022	421 36	Ammunition Storage Building	<ol style="list-style-type: none"> <li>1. Corrected Table 420-2 “MSRC Stowage Matrix.”</li> <li>2. Added Table 420-3 “Magazine Type and Gross Square Footage.”</li> <li>3. Added Containerized Long Weapons Storage (CLWS) magazine storage matrix and GSF to tables 420-2 and 420-3.</li> </ol>
October 3 2022	420	Ammunition Storage	<p>Updated CCN 420 hyperlinks to flankspeed site.                      Added CLWS Magazines to the storage matrix of Table 420-2.                      Changed sf for CLWS Magazines in Table 420-3                      Added note to 420-10.7 concerning Army MSM magazines being sited by NOSSA.</p>
4 January 2023	420 Series	Ammunition Storage	Updated Section 420-10.7 Estimating Future Magazines to address magazine spacing and continuous earth cover.
2 Mar 2023	400 Series	UFC 2-000-05N	Change UFC 2-000-05N to FC 2-000-05N document due to the fact that this planning criteria is not unified among the other DoD services.
17 Mar 2023	400 Series, Section 411-1	General Requirements	Change URL to access UFC 3-460-01 Petroleum Fuel Facilities.
17 Mar 2023	411-52	Cut and Cover Jet Engine Fuel Storage	Change URL to access UFC 3-460-01 Petroleum Fuel Facilities.
17 Mar 2023	411-60, Section 41160.2	Liquefied Petroleum Gas Storage	Change URL to access UFC 3-460—01 Petroleum Fuel Facilities.
13 Apr 2023	441-30, Section 44130-1	Hazardous and Flammables Storehouse	Replace references MIL-HDBK 1032/2 and UFC 4-442-01N with UFC 4-440-01.
30 May 2023	420 Series	Ammunition Storage	<p>Updated 420-4 Ordnance Handling, Loading and Offloading Area to define paved area as a single continuous plane with a 0.5% min to 2% max slope to allow for proper drainage away from the ECM.                      Redefined the size of loading area for Box Type C,D,G,H, MSM, and CLWS magazines</p>

## 400 SERIES SUPPLY FACILITIES

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## 411 LIQUID FUEL STORAGE – BULK

### 411-1 GENERAL REQUIREMENTS

The availability of commercial facilities, intended service, and government resources (available developable area, security and safety of operations, and operation) should be considered as part of the overall planning process. Special care should be noted of site conditions to ensure design criteria can be met. This information can be found in the most current version of Unified Facilities Criteria Design: Petroleum Fuel Facilities (UFC 3-460-01), located on the Whole Building Design Guide (WBDG) website at the following link:

<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-460-01>

This document also provides information on the ancillary equipment associated with liquid fuel storage (i.e., pumping station, pipelines, etc.). These facilities will typically have separate category codes.

**Note that the real property components associated with the category codes having FAC codes of 4111, 4112, and 4113 include the tanks and any containment structures associated with them, such as berms, liners, and monitoring wells. In the case of “cut and cover” type fuel storage under FAC 4113, the integral deep well turbine pumps are also included in the associated category codes and are not to be counted as separate real property assets.**

### 411-2 STORAGE QUANTITIES

The quantities and types of petroleum products to be stored are based on consumption of fuels by the ships, aircraft, vehicles and equipment at the activities served and what type of delivery system that is utilized. Depot fuel storage facilities must be of sufficient capacity to provide an adequate operating and reserve supply of fuel for the activities served. A barrel is the standard 42 U.S. gallon capacity.

411-2.1 **Capacities.** For planning purposes, the capacities of individual tanks should be approximately 25% of the ultimate storage for each type of fuel, subject to the following:

411-2.1.1 The minimum capacity of a tank for fuel depot bulk storage shall not be less than:

- Diesel Fuel 13,500 barrels
- Fuel Oil 27,000 barrels

411-2.1.2 Standard tank sizes should be used.

411-2.1.3 A minimum of two tanks will be provided for each type of fuel. One will serve as the working tank and the other the receiving tank for new deliveries.

411-2.1.4 It is necessary for impurities in MoGas, AvGas and jet fuels to settle prior to the use. The time required for jet fuel to settle is one hour per foot of depth of the fuel in the tank.

### **411-3 CATEGORY CODES**

The category codes in this section include fuel storage tanks of the following classifications: operational; bulk fuel; cut and cover; liquefied petroleum (LP); contaminated; and heating oil. CCNs 411-10 through 411-52 represent the fuel types associated with operational (10,000-100,000 barrel capacity), bulk fuel (greater than 100,000 barrel capacity), and cut and cover storage tanks (earth covered for hostile environments). CCNs 411-60 through 411-84 represent the remaining fuel types associated with this section.

#### **411 10 SHIP FUEL STORAGE 10K-100K (BL)**

**FAC: 4111**

**BFR Required: Y**

#### **411 11 SHIP FUEL STORAGE > 100K (BL)**

**FAC: 4112**

**BFR Required: Y**

#### **411 12 CUT AND COVER SHIP FUEL STORAGE (BL)**

**FAC: 4113**

**BFR Required: Y**

#### **411 20 AVIATION FUEL STORAGE 10K-100K (BL)**

**FAC: 4111**

**BFR Required: Y**

#### **411 21 AVIATION FUEL STORAGE > 100K (BL)**

**FAC: 4112**

**BFR Required: Y**

#### **411 22 CUT AND COVER AVIATION FUEL STORAGE (BL)**

**FAC: 4113**

**BFR Required: Y**



**411 30 DIESEL FUEL STORAGE 10K-100K (BL)**

FAC: 4111

BFR Required: Y

**411 31 DIESEL FUEL STORAGE > 100K (BL)**

FAC: 4112

BFR Required: Y

**411 32 CUT AND COVER DIESEL FUEL STORAGE (BL)**

FAC: 4113

BFR Required: Y

**411 40 MOTOR GASOLINE STORAGE 10K-100K (BL)**

FAC: 4111

BFR Required: Y

**411 41 MOTOR GASOLINE STORAGE >100K (BL)**

FAC: 4112

BFR Required: Y

**411 42 CUT AND COVER MOTOR GASOLINE STORAGE (BL)**

FAC: 4113

BFR Required: Y

**411 50 JET ENGINE FUEL STORAGE 10K-100K (BL)**

FAC: 4111

BFR Required: Y

**411 51 JET ENGINE FUEL STORAGE >100K (BL)**

FAC: 4112

BFR Required: Y

**411 52 CUT AND COVER JET ENGINE FUEL STORAGE (BL)**

FAC: 4113

BFR Required: Y

**DEFINITION.** The fuel products in these category codes 411-10 through 411-52 are organized into three basic categories: operational fuel storage, bulk fuel storage, and “cut and cover” fuel storage. Operational storage tanks are designed with capacities between 10K and 100K BL; bulk storage tanks are designed with capacities greater than 100K BL; and “cut and cover” storage tanks are designed with capacities typically between 10K and 100K BL (these are operational tanks used in potentially hostile environments). Bulk fuel storage tanks are supplied by pipelines, tank trucks, or rail

tanker cars. The bulk tanks in turn, supply operational fuel tanks and “cut and cover” storage tanks, which then supply the various fueling systems at an installation.

The Fleet Fuels Officer, Code N413F, within the US Fleet Forces Command in collaboration with Defense Logistics Agency’s (DLA) Defense Energy Support Center (DESC) Code B (Bulk Fuels) will determine the fuel storage requirement. Design guidance, including safety features, can be found in the most current version of Unified Facilities Criteria Design: Petroleum Fuel Facilities (UFC 3-460-01), located on the Whole Building Design Guide (WBDG) website at the following link:

<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-460-01>

Note that the real property components associated with the above category codes include the tanks and any containment structures associated with them, such as berms, liners, and monitoring wells. In the case of “cut and cover” type fuel storage, the integral deep well turbine pumps are also included in the associated category codes and are not to be counted as separate real property assets.

#### **411 55 BULK/READY FUEL ADDITIVE STORAGE (BL)**

**FAC: 4114**

**BFR Required: Y**

#### **411 60 LIQUEFIED PETROLEUM GAS STORAGE (BL)**

**FAC: 1244**

**BFR Required: Y**

41160-1 **DEFINITION.** The Navy uses liquefied petroleum gas, commonly known as LPG, for heating, metal cutting, brazing, in dental laboratories, aboard ships, and in similar installations. LPG consists predominantly of propane, propylene, with minor amounts of butane, isobutene, and butylene.

41160-2 **REQUIREMENT.** LPG is normally supplied in 100-pound cylinders or delivered by tanker truck or train car. The bulk storage capacity requirements for LPG depend on activity requirements, frequency of deliveries, and dependability of supply as well as lack of LPG on base operations. Historical data is a good resource for developing a requirement looking for predictable changes in demand (i.e., loss of metal shop, increase in ship homeporting, increase in local dental operations, etc.). Otherwise, review equipment specifications for consumption rate as well as equipment usage to determine basic requirement. Again, allow for impacts from delivery schedules and dependability. Design guidance, including safety features, can be found in the most current version of Unified Facilities Criteria Design: Petroleum Fuel Facilities (UFC 3-

460-01), located on the Whole Building Design Guide (WBDG) website at the following link:

<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-3-460-01>

## **411 82      CONTAMINATED FUEL STORAGE (BL)**

**FAC: 4211**

**BFR Required: Y**

41182-1      **DEFINITION.** A fuel storage facility requires temporary storage for off-specification (contaminated) fuel.

41182-2      **REQUIREMENT.** Separate tanks should be provided for each type of fuel stored and consumed in large quantities. Review historical data to determine typical volume of delivery and method and schedule of disposal to determine tank size.

## **411 84      BULK (DEPOT) HEATING FUEL STORAGE (BL)**

**FAC: 4111**

**BFR Required: Y**

41184-1      **DEFINITION.** Heating fuel oil storage may include storage tanks for kerosene and several different grades of diesel oil.

41184-2      **REQUIREMENT.** The station's requirements and mission will determine the quantity of any type of heating fuel oil stored. Some bases may rely on contract deliveries versus depot support. In these instances, depot storage should not be provided.

## **412           LIQUID STORAGE OTHER THAN WATER, FUEL AND PROPELLANTS**

### **412-1        GENERAL DESCRIPTION**

This group includes tank storage, accessories and piping for organic liquids such as cottonseed, linseed or soybean oils and other non-fuel liquids such as lubricants, ballast, or waste oils. Historical data should be available to determine rate of delivery and storage requirement. For waste liquids and oils, methods and schedule of disposals should be considered when determining storage requirement.

**412-2 STORAGE QUANTITIES**

No specific planning factors for the following category codes are currently available. Historical data may be used to develop the basic requirement including review of delivery schedules and removal of materials. Method of delivery/removal (i.e., pipeline to barge, truck, etc.), maximum quantity delivered/removed (is incoming quantity greater than outgoing quantity) and frequency (how often is material delivered to tanks and how often is material taken from tank) should also be considered.

**412-3 CATEGORY CODES**

The individual category codes in this group are shown below:

**412 15 ROAD OIL STORAGE (GA)**

FAC: 4121

BFR Required: N

**412 25 LUBRICANT STORAGE (GA)**

FAC: 4121

BFR Required: N

**412 35 BALLAST AND SLUDGE STORAGE (GA)**

FAC: 4121

BFR Required: N

**412 40 ORGANIC OIL STORAGE (GA)**

FAC: 4121

BFR Required: N

**412 45 MISCELLANEOUS LIQUID STORAGE (GA)**

FAC: 4121

BFR Required: N

**412 50 INDUSTRIAL/POL WASTE STORAGE FACILITY (GA)**

FAC: 4121

BFR Required: N

## **420            AMMUNITION STORAGE**

### **420-1        DEFINITION**

Ammunition storage utilizes magazines, general purpose and refrigerated storehouses, tanks, open storage pads and associated stationary equipment for storage of Ammunition, Inert Ammunition Components, Liquid Propellants and Weapon-Related Batteries.

Category groups pertaining to these facilities are as follows:

Code 421    Ammunition Storage (Tables 420-1 thru 420-19)

**The 421 series category codes have been re-organized to simplify and make category codes more consistent with magazine construction design. 421-22 High Explosive Magazine becomes the primary category code. The following category codes have been eliminated and rolled up under 421-22 High Explosive Magazine:**

- **421 12 Fuse and Detonator Magazine**
- **421 52 Smokeless Powder and Projectile Magazine**
- **421 72 Missile Magazine**
- **421 83 High Performance Magazine**

Code 423    Ammunition Storage -Liquid Propellants (Tables 420-20 thru 420-25)

Code 424    Weapon-Related Battery Storage

Code 425    Open Ammunition Storage

**NOTE: All planners developing magazine BFRs must have current certification through AMMO-36 Explosives Safety for Naval Facility Planning offered by the Defense Ammunition Center.**

### **420-2        GENERAL STORAGE REQUIREMENTS**

Ammunition and bulk explosives should be stored in magazines of approved design, sited and designated for specific purposes. The type and amount of material that may be stored in any magazine is dependent on the quantity-distance requirements and permissible storages as established by the Department of Defense Explosives Safety Board (DDESB) and as approved by the Naval Sea Systems Command. These safety distance requirements are designed to provide the inhabitants of nearby communities, military personnel, and adjacent public and private property reasonable safety from injury or destruction from possible fires or explosions, and to keep to a minimum the loss of valuable ammunition stores through fire or explosions.

### **420-3 MAGAZINE AREA**

The magazine area is the area surrounding a magazine or group of magazines, where personnel movements are restricted in the interest of safety. Magazines must be sufficiently remote from inhabited buildings, passenger railroads, and public highways, including navigable waters, so that the dangers and risks involved in storing explosives and ammunition are confined primarily to the magazine area. In order to insure this safety zone the DDESB has spacing criteria for magazines, based on the type of hazard involved and the quantity of explosives stored. See Naval Sea Systems Command Publication NAVSEA OP-5 Volume 1 (current revision) for Quantity-Distance Requirements. In the case of existing facilities, spacing criteria may limit the amount of explosives stored in a magazine to less than full capacity. In addition, limits have been set on the maximum amount of explosives that can be stored in certain types of magazines. This information is listed in the category code descriptions.

### **420-4 ORDNANCE HANDLING, LOADING AND OFFLOADING AREA**

For new construction of Earth Covered Magazines (ECM), a concrete area will be required in front of the ECM for handling, staging, inspection, loading and offloading ordnance. This paved area will ensure adequate space is available to handle ordnance in accordance with the safety principles and tenets outlined in NAVSEA OP 5 Volume 1, Ammunition and Explosives Safety Ashore. This paved area provides safe turning distances for Material Handling Equipment (MHE) transporting ordnance and for ordnance transportation conveyances while allowing spotters and safety observers a clear view of the operation from a safe distance. The area provides critical space and clearances for ordnance staging, set-down, and maneuvering containerized weapons and pallets to/from flat bed and enclosed commercial conveyances.

For Box Types C, D, G, H, and Containerized Long Weapons Storage (CLWS) Double Bay magazines, the paved area must be approximately 175' wide centered in front of the magazine and extend 85' outward from the magazine. For Box Type Modular Storage Magazines (MSM) and CLWS Single Bay magazines, the paved area must be approximately 100' wide centered in front of the magazine and extent 85' outward from the magazine.

The paved area must drain away from the ECM in a single continuous plane and the grade must be 0.5 % min with a 2.0 % max slope from the magazine.

The paved area must not be part of an adjacent road, but must connect with the adjacent road with an adequate turning radius or short access road. The paved area must be measured from the face of either, the ECM headwall where there is no loading dock or from the face of the ECM loading dock.

Where the above paved area is not available in front of the ECM, the planner must coordinate with the Local Ordnance Handling Activity and their respective Echelon III command to review and assess the impacts to ordnance handling safety. If the appropriate area is not provided, the Echelon III command must provide written (via email) concurrence of the proposed alternative to ensure all risk management concerns have been addressed or mitigated.

The ordnance handling, loading and offloading area will be recorded under Category Code 852-40.

#### **420-5 SEGREGATION OF MATERIALS**

The dangers or hazards involved in the storage of ammunition or explosives are not measured solely by the quantity of explosives stored, but also by its sensitivity - explosives that present similar hazards may generally be stored together. Tables showing compatibility relationships can be found in the NAVSEA OP-5, Vol. I (current revision).

#### **420-6 WEIGHT MEASUREMENT**

Net Explosive Weight (hereafter referred to as NEW). This is the weight of explosive material, and is measured in pounds. In items of ammunition with a high explosive main charge, fuses containing ignition explosives, and a propelling charge of smokeless powder, the NEW is calculated in accordance with NAVSEA OP-5 Vol. I, Chapter 5. It is the NEW of ammunition or bulk explosives that is used in application of explosive safety quantity-distance (ESQD) tables.

#### **420-7 SITING REQUIREMENTS**

To ensure the prevention of unacceptable damage or injuries in the event of an accidental explosion, siting criteria have been established to define minimum required separation distances between a Potential Explosion Site (PES) and other facilities. Minimum separation distances have also been established to prevent sympathetic detonation between two PESs, and to prevent prompt propagation of an explosives event between two PES's. ESQD minimum separation distances are based upon several factors including, but not limited to:

- The level of protection mandated by the applicable explosive safety standard
- The Exposed Site (ES) type and classification
- The NEW
- The hazard classification of the ammunition and explosives at a PES
- The physical orientation between the PES and the ES
- The presence of effective barricading

Minimum ESQDs are defined in the applicable DoD and service specific explosive safety standards for various applications. These ESQDs are based on maximum levels of risk considered acceptable for various types of ES. Separation distances are not absolute safe distances, but are relative protective or safe distances.

Use greater distances than those shown in the explosive safety standards whenever practicable.

Explosives safety site plans are required for construction projects involving new PESs, new facilities (explosive or non-explosive) within the ESQD arc of existing PES, as well as for the upgrading or renovation of existing facilities (explosive or non-explosive) that might impact the explosives safety criteria applied to these facilities (e.g., removal of hardening for fragmentation that previously allowed the facility to be at a lesser distance, change of mission that requires the facility to now be at a greater distance). These site plans are reviewed to ensure explosives safety criteria are being met by the proposed work. DoD requires most explosives safety site plans to be forwarded to the DDESB for review and approval. See NAVSEA explosives safety criteria for more detail on when a site plan is required and what level of site plan review and approval must be accomplished prior to commencing projects.

Table 420-1  
CCNs Requiring Site Approval

116-55	148-35	216-10	226-25	226-66	421-22	425-11
116-56	148-40	216-20	226-30	226-70	421-35	
143-20	148-45	216-30	226-35	226-80	421-42	
143-21	151-10	216-40	226-40	226-81	421-48	
143-60	151-70	216-50	226-45	226-82	421-62	
148-20	212-10	216-55	226-50	226-85	421-82	
148-25	212-30	216-77	226-55	226-86	425-10	
148-30	212-50	222-10	226-56	226-88	425-30	

Explosives safety site approvals are required for facilities of the CCNs of Table 420-1. See NAVSEA explosives safety criteria, OP-5 and NAVFACINST 11010.45 (latest rev) for more detail. **The planner preparing the site approval must have current certification through AMMO-36 Explosives Safety for Naval Facility Planning offered by the Defense Ammunition Center.**

## 420-8 AMMUNITION LOADING

The first step in preparing requirements for ammunition storage is obtaining the authorized ammunition load plan for the installation or command for which the requirement is being prepared. To obtain the authorized load plan, the planner should contact the local or regional representative from Naval Munitions Command (NMC). When an NMC load plan is not available, the planner should contact the tenant command for which the requirement is being developed and request a copy of the Arms, Ammunition, and Explosives (AA&E) loading.

The load plan could be the Global Requirements Based Load Plan (GRBLP) or another site-specific requirement such as the tenant command's N4 shop providing the Navy Ammunition Logistics Code (NALC) items and the quantity being used, averaged over a



one year period. The GRBLP is developed and maintained by Naval Supply Systems Command, Global Logistics Support in Mechanicsburg, PA. The GRBLP will be obtained by NMC from Ordnance Information System (OIS). NMC should adjust the data to properly reflect the added ammunition maintenance load as well as a reduction factor to account for the percentage of the items that need to be stored ashore versus the items deployed afloat. Fleet Commanders Ordnance staff should be consulted for fleet ordnance download requirements from ships. NMC will provide this “adjusted” GRBLP to the planner for use.

## **420-9 TYPES OF MAGAZINES**

The next step the planner should take is to determine the number of existing magazine assets for the installation or command and the exact type and size of each by design. This is contrary to typical requirement calculations made independent of existing facilities. A key component of the updated criteria is an accurate determination of the physical construction type of each magazine.

Earth-Covered Magazines (ECM) typically fall within one of the following categories. Details for these magazine types can be found in DDESB Technical Paper Number 15 (TP 15) Approved Protective Construction and UFC 4-420-01.

- Small “Keyport” or “Fuse & Detonator” magazines – typically smaller than 20’ x 20’
- Arch magazines – typically 25’ wide and varying in depth between 20’ and 80’ (can be standalone or one of three in a triple arch magazine facility).
- Legacy box magazines – Smokeless Powder and Projectile (SP&P), Standard Missile Magazines, Box Types A and B
- Modern box magazines – Box Types C, D, E, F and M
- Modular Storage Magazines (MSM) – 25’ wide and varying in depth between 20’ and 80’

Installations can commonly have several magazines that are modified versions of the types listed above. Both TP 15 and UFC 4-420-01 define magazine designs that are authorized for future construction. For new construction, the following magazines are recommended: Box Type C/D, Modular Storage Magazine (Navy), Modular Storage Magazine (European), Containerized Long Weapons Storage (32’ Single Bay, 50’ Double Bay). The CLWS magazine is currently under development and shall be ready 4<sup>th</sup> quarter of FY20. If a different magazine than the recommended designs listed above is being considered, the planner shall contact NOSSA to obtain approval for use.

The planner should contact the local NMC Detachment or Naval Ordnance Safety and Security Activity (NOSSA) for information on existing facilities. If this data does not exist, a detailed asset evaluation of the magazines should be conducted to identify the design of each ammunition storage facility. In addition, the planner shall consult the Magazine Design Type Identification Guide, which provides technical and detailed information on the various magazine design types (both legacy, and approved for new construction) used by the Navy and Marine Corps. The magazine type is an identifying

feature on the iNFADS Property Record Card. The Magazine Design Type Identification Guide is available on the NAVFAC Criteria Management Portal page: [Magazine Guide](#)

#### 420-9.1 **MAGAZINE ASSET EVALUATION**

When conducting an asset evaluation survey of an ammunition storage magazine, the planner should work with the NMC Detachment representative and have access to the installation's latest Explosives Safety Siting (ESS) software program. Planners should use the "Magazine Construction Assessment Report" (MCAR) to record the magazine physical characteristics while in the field (link to downloadable form is referenced below).

The planner should physically inspect and record the following data of each magazine:

- Interior Length - The interior measurement (to the nearest inch) of the distance from headwall to back wall.
- Interior Width - The interior measurement (to the nearest inch) of one side to the other. For arch magazines, this measurement is taken at the base of the wall.
- Interior Height - The vertical distance measured from the ground inside to the ceiling (to the nearest linear foot). For box type magazines the ceiling is sloped and the height will vary. The height should be measured at the high and low points.
- Exterior Length – The exterior measurement (to the nearest inch) of the magazine. For earth covered magazines, refer to the Magazine Design Type Identification Guide for specifications.
- Exterior Width – The exterior measurement (to the nearest inch) of the magazine. For earth covered magazines, refer to the Magazine Design Type Identification Guide for specifications.
- Doors - The number of doors, height and width (to the nearest inch), and thickness (to the nearest inch) of the door panel as well as the clear opening and location from center of headwall. Record if the door is single or double leaf design and whether the door is designed to swing open or slide open. If the door has more than one steel plate in thickness (i.e., is the door a built-up section), record details of the various plates and the channels/beams/bracing used to construct the door. Note the bracing and bearing surfaces supporting the door. Specifically, note any corbels on the ceiling or pull-up door stops in the floor.
- Headwall – Measure the thickness (to the nearest inch) of the thinnest part of the head wall. This may not be directly measurable at the door opening. Record any window or other opening in the headwall that is not concrete.
- Columns – Number, width, height and distance between (to the nearest linear half-foot) each column. Note the type and dimensions (width and height to the nearest inch) of the column header at the ceiling. Note if there are multiple

column rows and the number in each row as well as the distance between (side to side).

- Bays – Number of and distance between (front to rear) column bays.
- Miscellaneous – Indicate presence of loading dock, wing walls, IDS, revetment/berm/barricade, mechanical room and crane. Measure the loading dock length, width and total area (square feet). Measure the revetment distance from the headwall (feet). Identify IDS type and access type (rail, pallets, forklift, small missile, large missile, etc.).
- Photographs of each building, facility and structure. Photographs of the interior of the magazine, the head wall from the outside and inside, and the door from the outside and the inside. (NOTE: photographs are subject to security restrictions).
- Note any other structural feature such as HVAC openings, rails in the floor, added walls or racks

This data should be compared against known designs in the Magazine Design Type Identification Guide, available on the NAVFAC Criteria Management portal page to determine the magazine type. Both the MCAR and the Magazine Design Type Identification Guide are available on the Criteria Management portal page (located [HERE](#)). Because variations to the standard magazine types do exist at many installations, capturing the key structural features of each facility is essential. In these cases, the planner should consult with structural engineers from NAVFAC Capital Improvements or NOSSA. The CODEX is a 10-digit code which describes magazine type (including variants of the main types), strength (7 Bar, 3 Bar, and Undefined, as well as Flat Roof downgrade, and types of Above Ground Magazines (AGMs)), and exterior features such as barricades, access in/out of the magazine, and if there is or is not Intrusion Detection System (IDS) protection, and the level of security provided by the magazine. The CODEX coupled with the Magazine Construction Assessment Report (MCAR) provides the definition of a magazine which sites physical capabilities, strength and security requirements of ammunition stored. The CODEX consists of a ten-digit number represented by eight data fields in iNFADS. These fields are:

- Facility Type – 1<sup>st</sup> and 2<sup>nd</sup> digit
- Facility Sub Type – 3<sup>rd</sup> and 4<sup>th</sup> digit
- Strength Designator – 5<sup>th</sup> digit
- Barrier – 6<sup>th</sup> digit
- Access Type – 7<sup>th</sup> digit
- Intrusion Detection System (IDS) – 8<sup>th</sup> digit
- Mechanical Room – 9<sup>th</sup> digit
- Bridge Cranes/Monorails – 10<sup>th</sup> digit

Upon completion of the CODEX for each magazine, the planner shall validate the CODEX with the Installation Explosive Safety Officer (ESO). Once approved, the final MCAR shall be signed by the ESO and uploaded as an attachment to the property record card. In addition to uploading the signed MCAR, the magazine type must be entered for each facility via the “MCAR” tab located under the physical level tab of the

iNFADS Facility Module (at the utilization level). The information entered will subsequently appear on the Property Record Card.

Additional data that should be captured includes:

- Maintenance Responsibility UIC
- User UIC
- Presence of a front loading dock or apron. Loading docks shall be classified as a utilization within the magazine's property record card under Category Code 85115 "Load/Unload Ramp."
- Presence of front wing walls. These are concrete walls at ECMs that flank both sides of the headwall.
- Presence of a mechanical room. Mechanical rooms shall be classified as a utilization within the magazine's property record card under Category Code 89009 "Miscellaneous Utility Building."
- Presence of an adjacent, earthen berm or engineered revetment or barricade (typically either a steel or concrete structure). This structure should be recorded under Category Code 14910 "Protective Barricade/Revetment" and each non-contiguous asset should be counted separately on the property record card.
- Where there are multiple Hazard Class/Divisions (HC/D) in a magazine, the utilization of the magazine will be determined by siting the most restrictive HC/D.
- Where there are multiple tenant commands in a magazine, the utilization of the magazine shall be determined by the most restrictive HC/D material being held by the group of tenants.
- NOTE: Prior to changing the utilization Category Code of a magazine, the planner shall contact the Installation Explosive Safety Office and discuss/verify the action is acceptable.
- NOTE: Verify that the "Predominate Design" field in iNFADS aligns with the ESO's Safety Site Approval designation for the facility. This field shall only be changed with ESO approval.

## **420-10 PLANNING METHOD**

A facility requirement is established by comparing the required load plan to the available existing facilities to determine if sufficient space exists or if a deficit exists. The load plan could be the GRBLP or another site-specific requirement. The list of existing facilities is based on the list of explosive storage facilities with current approved site plans.

The methodology used for the comparison and the required level of detail is a factor of the relative size of the installation or area being considered. Two generic size categories are described here. These categories are not rigid and judgment should be used to determine the most effective analysis method.

- Small scenario (manual)–
  - Fewer than 5 storage magazines, or

- Storage of less than 4 item types, or
- Storage of a small load plan (less than 100 pallets/footprints) in which the number of pallets/footprints is already defined
- Large scenario –
  - Any scenario with 5 or greater storage magazines, or
  - Storage of 4 or greater item types, or
  - Storage of a large load plan with greater than 100 pallets/footprints, or
  - Any complex load plan of unknown characteristics

**NOTE: All planners developing magazine BFRs must have current certification through AMMO-36 Explosives Safety for Naval Facility Planning offered by the Defense Ammunition Center.**

The Magazine Storage and Requirements Calculator (MSRC) has been developed to facilitate the planning process. The planner has the option to use the MSRC for either scenario described above, as deemed fit. But the small scenario allows the planner to handle small/simple scenarios without using the MSRC. This tool can be obtained from the NAVFAC Criteria Management portal page along with an instruction manual for its use. The direct link to the tool and all supporting resources is located here, and requires Common Access Card (CAC) access:

[Magazine Storage & Requirements Resources](#)

420-10.1 **PLANNING METHODOLOGY.** The general planning process follows the same steps regardless of the approach used. Each of the following steps is described in more detail for each scenario size. Instances in which the MSRC can or should be used are identified.

1. Characterize the load plan.
2. Define the list of existing magazines.
3. Perform a stowage analysis.
4. (Optional in the event of a deficit of magazine space) Identify the preferred magazine type for hypothetical additional magazines and then optimize the storage of the remaining load plan items into this magazine type.
5. Magazines facilities are pre-approved, non-deviation, construction designs. The MSRC will provide the required number of magazines in whole units and if the planner is developing the requirement by hand calculation, the final requirement shall also be in whole units.

420-10.2 **CHARACTERIZE THE LOAD PLAN.** This step translates a load plan of individual items (e.g., bullets and bombs) into a defined number of stowage footprints (e.g., 46 pallets and 12 large bombs) as defined in Table 420-1. The load plan is obtained from NMC or other tenant command and has been previously adjusted by NMC to properly reflect the added maintenance load as well as a reduction factor to

account for the percentage of the items that need to be stored ashore. NMC will provide this “adjusted” GRBLP to the NAVFAC planner or contractor for use.

At a minimum, the GRBLP will contain the Navy Ammunition Logistics Code (NALC) and a quantity of individual items for each NALC. The GRBLP may also include an “owner” or other designator, though this is not necessarily required.

The planning process (either using the MSRC or any “manual” process) will translate the load plan into an equivalent number of generalized footprints. The generalized footprint types used in this process are (with nominal storage Length x Width x Height provided in inches):

- Standard Pallet (48x40x34)
- Oversized Pallet (53x47x43)
- Small Bomb (65x36x32)
- Large Bomb (107x41x24)
- Small Missile (127x43x24)
- Medium Missile (159x36x49)
- Large Missile (241x40x41)
- Extra Large Missile (308x40x40)

If the MSRC is used (for either a small or large scenario), the GRBLP is entered into the spreadsheet and the equivalent number of various footprints can be output as a report.

Additional factors including Hazard Class/Division (HC/D), storage Compatibility Group (CG) and NEW of each item are also gathered for each item. If the MSRC is used, these values are obtained automatically from the technical data obtained from OIS based on the NALC for each item.

Where there are multiple Hazard Class/Division (HC/D) ordnance in the load plan, the BFR CCN will be determined by siting the most restrictive HC/D.

420-10.3 **DEFINE THE LIST OF EXISTING MAGAZINES.** In this step, magazines that are acceptable for storage of the load plan are identified with sited NEW quantities. This list should be correlated with iNFADS, NMC and NOSSA for agreement. Magazines typically fall within one of the following categories. Details for these magazine types can be found in TP 15.

- Small “Keyport” or “Fuse & Detonator” magazines – typically smaller than 20’ x 20’
- Arch magazines – typically 25’ wide and varying in depth between 20’ and 80’
- Legacy box magazines – Smokeless Powder and Projectile (SP&P), Standard Missile Magazines, Box Types A and B
- Modern box magazines – Box Types C, D, E, F and M
- Modular Storage Magazines (MSM) – 25’ wide and varying in depth between 20’ and 80’

The NAVFAC planner or contractor obtains the list of magazines from iNFADS and verifies with the local installation. Sited NEW values are obtained from the local Explosives Safety Officer, Installation Planner or NOSSA. The MSRC includes the capability to import a list of magazines generated from the ESS software. See the MSRC User's Manual for details.

Each of the magazines other than the small Keyport and Fuse & Detonator types can be modeled in the MSRC as a standard type. Other types can be modeled as user-defined magazine types in the MSRC.

**420-10.4 ANALYSIS PROCESS.** In this step, the load plan is systematically allocated throughout the existing magazines. This process may be very direct for small scenarios. For larger scenarios, the MSRC has been developed to facilitate this process using methods and requirements approved by NAVFAC, NMC, Fleet and NOSSA. The intended outcome of this step is to show that all munitions in the load plan can be stowed within the list of available magazines while satisfying CG rules, sited NEW limitations and spatial constraints.

The maximum number of footprints within a specific type of magazine can be obtained using the MSRC stowage matrix shown in Table 420-1. Small Keyport and Fuse & Detonator magazines are not accounted for in this table.

This table assumes that all items are stacked 3 containers high. If a given NALC has a different maximum allowable stack height, the values in Table 420-1 would be scaled accordingly. If the number of footprints to be stowed does not entirely fill one or more stacks, empty spaces must be accounted.

Fractions are used to account for mixing of various footprint types. As an example of this, if an 80' Arch contains 58 large bombs (50% of its capacity for large bombs), it could only accept 49 standard pallets (50% of its theoretical max capacity of standard pallets) before it is considered completely full.

The values in this table have been determined by NMC, NAVFAC and NOSSA, and NAVSEAINST 8024.2 (latest revision) and account for all rows and other wall standoff requirements.

**Table 420-2  
MSRC Stowage Matrix**

<b>Magazine Type (depth)</b>	<b>Standard Pallet</b>	<b>Oversized Pallet</b>	<b>Small Bomb</b>	<b>Large Bomb</b>	<b>Small Missile</b>	<b>Medium Missile</b>	<b>Large Missile</b>	<b>Extra Large Missile</b>
Arch (20')	20	--	--	--	--	-	--	--
Arch (25')	26	--	--	--	--	--	--	--
Arch (40')	48	--	--	--	--	--	--	--
Arch (50')	65	30	109	68	--	--	--	--
Arch (80')	98	48	153	116	--	--	--	--

Magazine Type (depth)	Standard Pallet	Oversized Pallet	Small Bomb	Large Bomb	Small Missile	Medium Missile	Large Missile	Extra Large Missile
Triple Arch	294	144	459	348	--	--	--	--
SP&P I	432	216	288	144	192	144	--	--
SP&P IIA	480	396	480	240	264	198	60	--
SP&P IIB	426	276	303	198	224	114	30	--
Box A	426	276	303	198	224	114	30	--
Box B	468	306	338	212	192		36	--
Box C	450	288	324	216	240	126	36	36
Box D	750	432	525	360	400	198	90	60
Box E	450	288	324	216	240	126	36	36
Box F	750	432	525	360	400	198	90	60
Box M *	--	--	--	--	--	--	153	108
Std Missile Mag I	408	286	305	198	182	--	--	--
Std Missile Mag II	430	302	324	225	120	--	--	--
MSM (20')	30					--	--	--
MSM (40')	78	72	108	60	72	15	--	--
MSM (60')	129	108	162	90	108	22	--	--
MSM (80')	180	144	207	120	144	30	--	--
CLWS 32' x 93.5					84	60	48	36
CLWS 32' x 117					168	126	60	48
CLWS 50' x 117 Double Bay					504	336	210	168

\* Box M has not been considered for any application other than Large and Extra Large Missiles

420-10.5 **SMALL SCENARIO ANALYSIS.** For a small scenario, it is not necessary to use the MSRC. If the number of equivalent footprints within the load plan has been determined (see Section 420-10.2) and the magazine types have been defined (see Section 420-10.3), the NAVFAC planner or contractor can distribute the load plan throughout the magazines manually. CG mixing rules, sited NEW quantities, as well as any other physical constraints must be considered.



The planner can directly compare the number of generalized footprints to the values shown in Table 420-2 for the available magazine types. Magazines can be filled with a mix of footprint types if necessary. In this case, fractions of a full magazine would be used as described in Section 420-10.4.

The output from this analysis would be a listing of all load plan items stowed, and if applicable, a listing of load plan items not stowed. The magazine(s) used for stowage should be listed for each load plan item. These outputs can be used to populate the BFR report.

**420-10.6 LARGE SCENARIO ANALYSIS.** These scenarios should be analyzed using the MSRC. An iterative process is used to optimize the allocation of the load plan throughout the list of available magazines. The MSRC allows the user to systematically work through the load plan to ensure that required storage constraints are met, and if desired, specific munitions are stowed in compatible magazines. Examples of this include items requiring Intrusion Detection Systems (IDS) are stowed in magazines equipped with IDS, or particular items may be required to be stowed in a specific area of the installation, depending on local guidance and discretion.

Detailed instructions for the use of the MSRC are provided in the MSRC Users' Manual provided with the tool. Here is a direct link to the user manual. Common Access Card (CAC) access is required.

#### [MSRC User's Manual](#)

The MSRC provides many options for output from the analysis beyond generating the BFR. Some of these options include a listing all load plan items stowed. If applicable, a listing of load plan items not stowed and a theoretically stowed items listing in each magazine are also included.

**420-10.7 ESTIMATING FUTURE MAGAZINES.** This section describes the additional magazines planning process, whether they are planned as part of a new installation or to meet an existing storage capacity deficit.

In the event that the load plan cannot be completely stowed within the existing magazines, or in the event that a potential future scenario is being studied, the MSRC can be used to estimate the number of magazines required to store this material. In this scenario, the proposed magazines' sited NEW must be determined or estimated (see Section 420-10.2) to ensure a proper required magazines quantity. The proposed sited NEW estimates may be used in the tool, but must be verified by the Explosive Safety Software (ESS) Planning Tool option prior to using the information in a BFR. To use this methodology, check with the local Explosives Safety Officer, Installation Explosive Safety Planner or NOSSA.

Where multiple magazines are proposed at less than 500,000 pounds NEW, if possible, increase the Intermagazine Distance (IMD) separation distance to 100 ft. both “Side to Side” and “Rear to Rear” and 160 ft. “Front to Rear.” This will support a temporary waiver to increase the magazine’s allowed NEW storage up to 500,000 pounds when events dictate such a waiver.

Where magazines are proposed at a “restrictive land available site” and continuous earth cover is considered, as part of the siting criteria, the following must be met:

- a) the Intermagazine Distance (IMD) separation distance both Side to Side, Rear to Rear, Front to Rear and;
- b) the two earth covers intersect at or below a point  $\frac{1}{2}$  the height of the two structures – i.e.  $H/2$  where H is the height of the structure (at structures highest point).
  - a. Example: two Box Type D magazines – 15'-8" (height of interior roof at front of magazine) + 1'6" (roof thickness) = 17'-2", 17'-2" divided by 2 = 8'-7". The low point of the earth cover must at or below 8'-7" as measured from finished grade.

If only one or two types of munitions need to be stowed, the MSRC Stowage Matrix can be used directly to estimate the number of required magazines. Compatibility Group mixing rules as well as sited NEW quantities and any other physical constraints must be considered.

The MSRC can be used to estimate required magazines to stow any remaining load plan for an analysis or theoretical scenarios. When using the MSRC, the user will select the preferred magazine type to be constructed. By default, Box Types C, D, CLWS Single Bay, CLWS Double Bay or any size of MSM should be selected for the analysis. Other magazine types are not permitted for new construction.

The following table is from the Whole Building Design Guide:

**“Ammunition and Explosive Storage Magazines: ECM Approved For New Construction”**

<https://www.wbdg.org/building-types/ammunition-explosive-magazines/ecm-approved-new-construction>

**Table 420-3  
Magazine Type and Gross Square Footage**

<b>Magazines Approved for New Construction per Department of Defense Explosive Safety Board (DDESB) Test Paper (TP)-15, “Approved Protective Construction”</b>			

Magazine Type	Drawing Number	Number of Doors/"Bays"	Gross Square Footage (GSF)
RC Box Type "C"	14004689-14004720 Rev. 1 (Without Platform)	3	5,920
RC Box Type "C"	14005091-14005122 Rev 1 (With Platform)	3	5,920
RC Box Type "D"	18232899-18232936 (Without Platform)	5	10,057
RC Box Type "D"	18232899-18232978 (With Platform)	5	10,057
Modular Storage Magazine:	Army:421-80-07	1	2,124.22
Modular Storage Magazine:	<b>NAVY:</b> 14063806-14063858 <b>ARMY:</b> 421-80-08, 421-80-13	1	
25' w x 20' depth variant		1	894
25' w x 40' depth variant		1	1,438
25' w x 60' depth variant		1	1,978
25' w x 80' depth variant			2,518
CLWS, Single Bay, 32' w x 93'-6" depth	TBD	1	3,706
CLWS, Single Bay, 32' w x 117' depth	TBD	1	4,552
CLWS, Double Bay, 50' w x 117' depth per bay	TBD	2	13,254

## Notes:

1. Army ECM, Concrete Oval-Arch, dwg. No. 421-80-09, 25' width x 90' depth is approved for new construction but door width of 8' limits the use of the magazine to Small Bombs, Oversized and Standard Pallets.
2. Army RC Box, Dwg No. 421-80-07, 24' width x 80' depth, are approved for construction but in lieu of sliding doors have two steel doors that are manually opened and there is a 4" lip at base of opening for doors to rest against, causing loading/unloading issues.

3. Army RC Box, Dwg No. 421-80-13, 25' width x 80 depth is approved for European construction but NOSSA will required modifications to the design drawings to support Lightning and Electrical.
4. Munitionslagerhause (German Deign) magazines, although shown as approved for new construction, will require a review and design update before being avail for NOSSA/DDESB approval for construction.

## **420-11      CONTAINERIZED AMMUNITION**

Implementation of directives for containerizing ammunition for shipment is now underway at certain ordnance activities, initially at coastal POE's. For these activities, category codes and planning factors have been developed to facilitate proper identification and sizing of the facilities that are in support of containerized ammunition shipments. The following category codes and planning factors are established for handling of ammunition by containers. As warranted, additional category codes and planning factors will be developed.

148 35	Container Holding Yard (Loaded)
148 40	Container Transfer Facility
148 45	Rail/Truck Receiving Station
151 70	Ordnance Container Handling Pier
152 70	Ordnance Container Handling Wharf
156 20	Container Operations Building
218 10	Container Repair and Test Building
425 20	Container Holding Yard (Empty)
860 20	Explosive Barricade for Suspect Trucks and Railroad Cars

## **421            AMMUNITION STORAGE DEPOT AND INSTALLATION**

### **421-1        DEFINITION**

Ammunition storage utilizes magazines or other suitable containers to store ammunition for the ultimate user's logistic flexibility at an activity. Planning methods are provided for the following types of ammunition storage facilities:

421 22	High Explosive Magazine
421 32	Inert Storehouse
421 35	Ready Magazine
421 42	Smokedrum Storehouse
421 48	Small Arms/Pyrotechnic Magazine
421 62	Special Weapons Magazine

### **421 12      FUSE AND DETONATOR MAGAZINE (SF)**

**FAC: 4211**

**BFR Required: Y**

**This category code is no longer in use. Please use 421 22 High Explosive Magazine or 421 48 Small Arms/Pyrotechnic Magazine as appropriate.**

## **421 22 HIGH EXPLOSIVE MAGAZINE (SF)**

**FAC: 4211**

**BFR Required: Y**

42122-1 **DEFINITION.** A high-explosive magazine is used for the storage of mass- detonating explosives. Bomb, warheads, missiles, naval mines, demolition charges are examples of munitions generally stored in high explosive magazines. Refer to the Magazine Design Type Guide for types of magazines commonly found on installations.

Please refer to Section 420-8 TYPES OF MAGAZINES for details on how to survey existing magazines and DDESB Technical Paper Number 15 (TP 15) Approved Protective Construction and UFC 4-420-01 for descriptions of magazines and those authorized for construction.

**Note: The following category codes have been eliminated and rolled up under 421-22 High Explosive Magazine:**

- **421 12 Fuse and Detonator Magazine**
- **421 52 Smokeless Powder Projectile Magazine**
- **421 72 Missile Magazine**
- **421 83 High Performance Magazine**

## **421 32 INERT STOREHOUSE (SF)**

**FAC: 4211**

**BFR Required: Y**

42132-1 **DEFINITION.** Storehouses for inert material are usually 50 x 200 ft. or 106 x 204 ft. or multiples of these basic dimensions, and are similar to commercial warehouses. These storehouses are used for the storage of such non-explosive items as bomb tails, machine gun links, empty cartridge cases, and packing materials.

Although the height of stowage in these storehouses depends on the type materials, the average stacking height is about 10 feet. Storage space available for storage will meet a minimum criteria of 60 percent of net storage space used for storage operations. The net storage capacity of the 50 x 200 ft. storehouse is approximately 60,000 cubic feet. For planning of installation inert storehouses use only the 50 x 200 ft. storehouse.

**421 35 READY MAGAZINE (SF)****FAC: 4221****BFR Required: Y**

42135-1 **DEFINITION.** This category code and nomenclature encompasses two specific types of magazines whose requirements are determined by the function performed. The three types of magazines within this category code are identified as:

(a) **Ready Service Magazine.** When shore establishments require certain types of ammunition to be stored in a ready service condition, in order to reduce the arming time, the ammunition may be stored in designated Ready Service Magazines. A 12' x 17' box-type magazine is suitable for performing this function. This facility is usually located at an air station and is used to hold ammunition and/or weapons that are built up from a storage configuration ready for arming an aircraft, or to receive for temporary storage, ammunition and/or weapons from aborted aircraft. These paved areas for loading or unloading ordnance from an aircraft are typically captured under CCN 11656 "Combat Aircraft Loading Area (CALA)".

(b) **Special Service Magazine.** This type of magazine is provided in or near such facilities as loading plants, filling houses, weapon assembly buildings, ammunition maintenance buildings and Weapon Quality Evaluation Laboratories. The magazine can be a special size and construction, depending upon the material(s) stored therein. However, a 6' x 8' Keyport magazine has been found to be most suitable for this application. The need to provide segregation of non-compatible, open explosives frequently gives rise to a requirement for separate magazine structures, irrespective of any loading factor. Historical data should be used to determine the number of these facilities required which is dependent upon both the amount of explosives stored and the compatibility of the explosives themselves.

**Note: Ready Service Lockers (i.e. RSLs, GOLANs, RMAG, NABCOs, CONEXs, etc.) are not Class 2 Real Property and shall not be entered into iNFADS. NAVFAC HQ instruction on RSLs as equipment/non-RP can be found here: [NAVFAC HQ RSL Instruction](#). Concrete pads supporting RSLs shall be recorded under Category Code 425 11. The Pad should be sited for RSL's NEW limit.**

**421 42 SMOKEDRUM STOREHOUSE (SF)****FAC: 4211****BFR Required: Y**

42142-1 **DEFINITION.** Chemical and smoke mixtures are stored separately in fire-hazard type magazines or in buildings especially designed for such storage. Drums of smoke mixture may be stored in surface buildings with special racks for

support, and overhead equipment for handling. Smokedrum storehouses are of the sizes and capacities shown in Table 42142-1.

**Table 42142-1  
Smokedrum Storehouses**

Size Number	Capacity (Drum)	Approximate Bldg Dimensions In Feet				
		W		L		H
1	120	25	x	17	x	14
2	240	25	x	34	x	14
3	360	25	x	51	x	14
4	480	25	x	58	x	14

For more than 480 drums, two or more buildings should be provided.

**421 48 SMALL ARMS/PYROTECHNICS MAGAZINE (SF)**

**FAC: 4211**

**BFR Required: Y**

42148-1 **DEFINITION.** This structure may be used to store Class 1 Division 3 and 4 ammunition. This type of magazine may vary considerably in size and description. The standard earth-covered concrete arch magazine without barricade and the non-earth covered two compartment magazine are commonly used for this purpose. If the land area is limited and there is a large requirement for small arms/pyrotechnics storage space, the large triple arch magazine maybe used. See section 420-9 PLANNING METHOD to calculate requirements. For ammunition class descriptions, see OPNAVINST 8020.8.

**421 52 SMOKELESS POWDER PROJECTILE MAGAZINE (SF)**

**FAC: 4211**

**BFR Required: Y**

**This category code is no longer in use. Please use 421 22 High Explosive Magazine or 421 48 Small Arms/Pyrotechnic Magazine as appropriate.**

**421 62 SPECIAL WEAPONS MAGAZINE (SF)**

**FAC: 4211**

**BFR Required: Y**

42162-1 **DEFINITION.** The special weapons magazine is the same type of structure as the high explosive magazine and differs only in that it is used for the

storage of nuclear weapons. Magazines used for the storage of special weapons are subject to quantity-distance requirements and are limited to the maximum amount of nuclear material that can be stored in any one magazine. This information, along with the sizes and weights of nuclear weapons and security requirements can be obtained from:

- (S) SWOP 20-7, NUCLEAR SAFETY CRITERIA (U)
- (S) SWOP 50-1, NUCLEAR ORDNANCE GENERAL INFORMATION (U)
- (C) OPNAVINST C5510.83 SERIES, CRITERIA AND STANDARDS FOR SAFEGUARDING NUCLEAR WEAPONS (U)

Planning data for Category Code 421 62 related to specific locations will be classified in accordance with cognizant Navy directive.

### **421 72 MISSILE MAGAZINE (SF)**

**FAC: 4211**

**BFR Required: Y**

**This category code is no longer in use. Please use 421 22 High Explosive Magazine.**

### **421 82 SUBMARINE LAUNCHED BALLISTIC MISSILE STORAGE FACILITY (SF)**

**FAC: 4211**

**BFR Required: Y**

42182-1 No criteria are currently available for this Category Code.

### **421 83 HIGH PERFORMANCE MAGAZINE (SF)**

**FAC: 4212**

**BFR Required: Y**

**This category code is no longer in use. Please use 421 22 High Explosive Magazine or 421 48 Small Arms/Pyrotechnic Magazine as appropriate.**

## **423 AMMUNITION STORAGE – LIQUID PROPELLANTS**

### **423-1 DEFINITION**

The siting of liquid propellant (energetic liquids) storage facilities and the amount of propellant that can be stored are subject to strict safety criteria due to the fire and/or detonation hazards involved. Factors such as the degree of hazard and the compatibility of propellants stored in close proximity to each other affect the spacing of storage facilities and the amount of propellant that can be stored. NAVSEA OP-5 Vol. 1,



Ammunition and Explosives Ashore provides criteria on hazard classification, quantity-distance tables, storage compatibility, and explosive equivalents.

### **423 10 LIQUID PROPELLANT STORAGE (GA)**

**FAC: 4231**

**BFR Required: Y**

42310-1 **DEFINITION.** Storage vessel dimensions along with relevant siting requirements can be used to develop facility requirements.

### **423 20 LIQUID PROPELLANT DISPENSING FACILITY (GM)**

**FAC: 1221**

**BFR Required: Y**

42320-1 **DEFINITION.** Liquid propellant storage and dispensing facilities shall satisfy the operational requirements of the particular command within whose jurisdiction the facilities are located.

### **424 WEAPON-RELATED BATTERY STORAGE**

#### **424-1 DEFINITION**

Weapon-related storage utilizes refrigerated warehouses that are capable of maintaining at least subfreezing temperatures. This code is not to be used for other cold storage facilities.

### **424 10 WEAPON-RELATED BATTERY STORAGE (SF)**

**FAC: 4241**

**BFR Required: Y**

42410-1 **DEFINITION.** Storage requirements can be determined from the quantity to be stored and the types of equipment used to rack and stack the batteries.

### **425 OPEN AMMUNITION STORAGE**

425-1 **DEFINITION.** Provides open hardstands (pavements or prepared/stabilized surfaces) for ammunition storage and excludes all other hardstands.

### **425 10 OPEN AMMUNITION STORAGE PAD (SY)**

**FAC: 8526**

**BFR Required: Y**

42510-1 **DEFINITION.** Refer to NAVSEAOP-5 Vol. 1 for regulations governing open storage of explosive material. Ordnance open storage is undesirable.

42510-2 **EXPLOSIVE SAFETY SITE APPROVAL.** Explosives safety site approvals are required for facilities of this category code. See NAVSEA explosives safety criteria for more detail. The planner preparing the site approval must have current certification through AMMO-36 Explosives Safety for Naval Facility Planning offered by the Defense Ammunition Center.

## **425 11 EXPLOSIVE STORAGE SITE PAD (SY)**

**FAC: 8526**

**BFR Required: N**

42511-1 **DEFINITION.** This category code covers the pad, which must be made of concrete or asphalt, that Ready Service Lockers or reduced Quantity Distance (QD) equipment (i.e. RSLs, GOLANs, RMAG, NABCOs, CONEXs, etc.) are placed on. The site pad must be marked with a permanent facility marker (i.e. concrete monument, bollard, or placard) in accordance with the Installation Appearance Plan. The marker must be of the same level of permanent construction as the site pad.

For a newly constructed site pad, the edges must be constructed such that there is a minimum 1' offset from any point along the perimeter of the storage equipment. The intent is to provide a 1' offset on all four sides of rectilinear equipment, or a minimum of a 1' offset at any point along the perimeter of non-rectilinear equipment.

For site pad areas obtained from existing paved surfaces such as aircraft aprons, etc., the dimensional rules for new pads still apply. In these cases, the dimensional area must be delineated by permanent markings such as road striping, permanent corner markers, or similar permanent markings, such that the dimensions of the site pad area can be validated at any point in the future.

The site pad must be sited for the equipment's NEW limit and the site pad's NFA number shall be incorporated into the site approval process, (i.e. NFA 0001, RSL 0001-1 RO 0001-1). The equipment number shall be a follow on number of the structure (i.e. 0001-1 or 0001-A).

The tenant command is responsible for maintenance (i.e. grounding and bonding test, etc.) of the storage equipment (i.e. RSL or other reduced QD equipment) on the site pad. The Installation's Public Works Department is responsible for maintenance of the site pad (as it is real property).

If the planner is establishing a site pad area on an existing and approved contiguous surface, the planner must subtract the area of the site pad from the property record card of the existing contiguous surface.

42511-2      **EXPLOSIVE SAFETY SITE APPROVAL.** This structure is required to support equipment that stores explosive material. Therefore, explosive safety site approvals are required for equipment placed on this structure. In accordance with NAVSEA OP 5 Volume 1 (latest revision), the facility number for the site approval must reference the structure (site pad). See NOSAINST 8020.22 (latest revision), NAVSEA OP 5, Volume 1 (latest revision), and NAVFAC Instruction 11010.45 for more detail. The planner preparing the site approval must have current certification through AMMO-36 Explosives Safety for Naval Facility Planning offered by the Defense Ammunition Center.

**Note: Ready Service Lockers (i.e. RSLs, GOLANs, RMAG, NABCOs, CONEXs, etc.) are not Class 2 Real Property and shall not be entered into iNFADS. NAVFAC HQ instruction on RSLs as equipment/non-RP can be found here: [NAVFAC HQ RSL Instruction](#). The Pad shall be sited for RSL's NEW limit.**

## **425 20      CONTAINER HOLDING YARD (EMPTY) (SY)**

**FAC: 4251**

**BFR Required: Y**

42520-1      **DEFINITION.** An empty ISO container-holding yard should be capable of storing at least one full container shipload plus 1/3 more. As the pipeline becomes full of containers, each container ship will discharge one container for each one loaded. Additionally, empty containers awaiting testing, repairs, stuffing or shipment to inland points will be on hand. Assuming a single berth pier/wharf for a 750 container ship, planning for an empty container-holding yard should be for 1,000 empty containers. See Figure 42520.1 for a typical 1,000-container yard layout. Total area of the holding yard is 19,180 SY. Size is predicated on 8' x 8' x 20' containers stacked three high. Containers are handled with container handling equipment or straddle carriers.

**Figure 42520.1-Typical 1,000 Container Yard Layout**

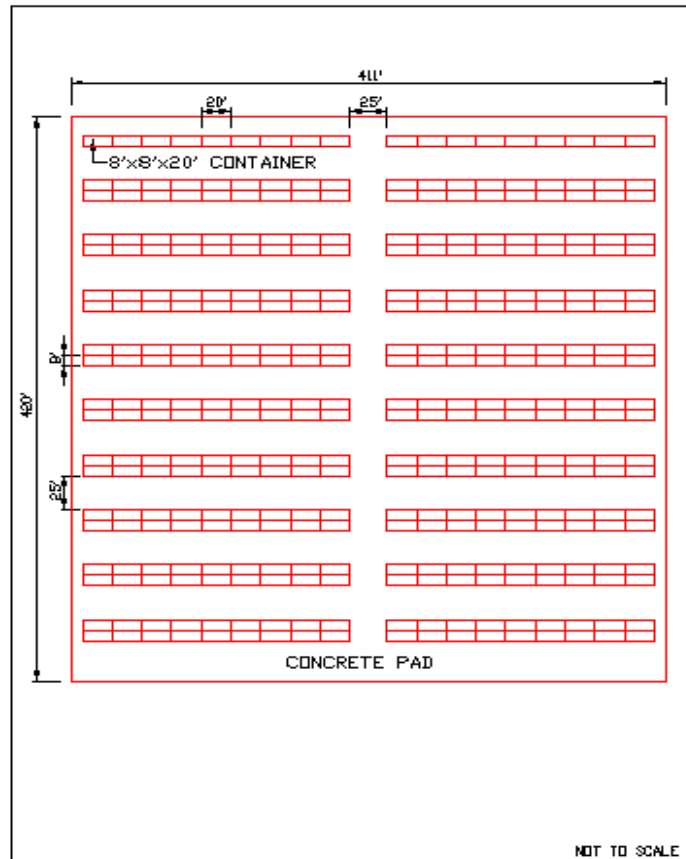


FIGURE 425-E0  
CONTAINER HOLDING YARD (EMPTY)

## 425 30 BARRICADED MODULE (SY)

FAC: 4251

BFR Required: Y

42530-1 **DEFINITION.** A barricaded module is a barricaded area comprising of a series of connected cells with hard surface storage pads separated from each other by barricades. A light shed-type metal roof or fire retardant tarpaulin installed in a manner to provide sufficient ventilation between the tarpaulin and the stored ammunition may be used to cover the individual cells. Heavy structures or flammable materials will not be used for this purpose.

The maximum net weight of explosives permitted to be stored within each cell is 250,000 pounds. Storage pads should be hard surfaced, if possible, in order to minimize the effects of earth shock from an accidental explosion. No restrictions are imposed upon the arrangement of cells within a module or upon the arrangement of groups of modules, except that all cell openings will not be faced toward each other unless they are barricaded or meet the standard quantity-distance criteria for un-barricaded above ground magazines. See Figure 42530.1 for typical module layout. See NAVSEA OP-5 for site restrictions and facility design requirements.

Figure 42530.1 Typical Module Layout

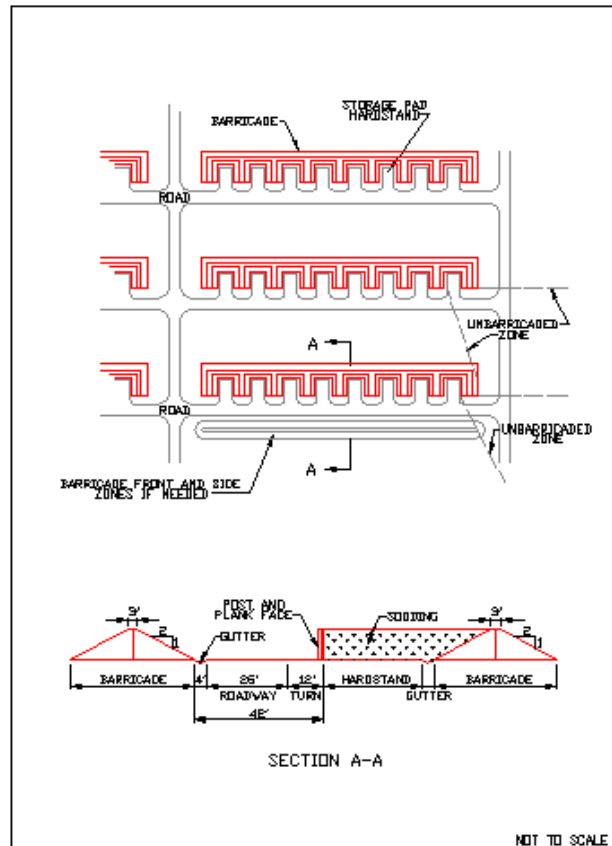


FIGURE 425-30  
TYPICAL ARRANGEMENT OF EIGHT-CELL MODULES

42530-2 **EXPLOSIVE SAFETY SITE APPROVAL.** Explosives safety site approvals are required for facilities of this category code. See NAVSEA explosives safety criteria for more detail. The planner preparing the site approval must have current certification through AMMO-36 Explosives Safety for Naval Facility Planning offered by the Defense Ammunition Center.

## 430 COLD STORAGE

### 430-1 DEFINITION

Cold storage is planned to provide refrigerated warehouses for storage of General Supply Materials which require temperatures ranging from  $-10^{\circ}\text{F}$  to  $60^{\circ}\text{F}$  in the following categories:

- Perishable Substances
- Photosensitized Material

- General Supply Batteries
- Medical and Dental Supplies

## **430-2 EXCLUSION**

Excluded from this category group are cold storage for weapons-related batteries (use Category Code 424 10) and cold storage spaces that are a functional part of another facility such as an open mess, club, hospital, commissary or exchange. These cold storage spaces are planned as part of their respective main facilities and are accommodated within its space allowances.

## **430-3 OTHER APPLICABLE REQUIREMENTS**

In most CONUS locations, Cold Storage Facility requirements have been all but eliminated through changes in supply business processes. Direct Vendor Delivery contracts provide such materials directly to end users in an as needed frequency required to effectively transfer the related warehousing from the public to the private sector vendors. These requirements guidelines are provided for those missions who do require an installation or area storage facility to hold some measure of items requiring cold storage.

## **430-4 STORAGE OF FARINACEOUS AND HIGH ACID FOOD PRODUCTS**

These food products are properly stored in an environment where the temperature is between 50 and 70 degrees Fahrenheit. A cold storage warehouse will be required to provide chill storage at those activities where climatic conditions preclude the use of a general purpose warehouse.

## **431 10 COLD STORAGE WAREHOUSE (SF)**

**FAC: 4311**

**BFR Required: Y**

43110-1 **DEFINITION.** A cold storage warehouse is planned to preserve the quality of perishable foods and general supply materials that require refrigeration. The warehouse will include freeze and chill space and normal processing facilities and mechanical areas. The space requirements are applicable to cold storage facilities of all sizes whether built as separate structures or in conjunction with other buildings and are determined by using the criteria furnished in the BFR guidance above. For installations with such requirements, correlated to loading, Table 43110-1 provides a means of estimating cubic feet. The facility requirements are based upon the cubic foot space required per man per 30 days. This method utilizes subsistence consumption requirements for shore facilities and provides for two types of storage requirements.

For additional information, see MIL-HKBK 1032/2.

**Table 43110-1**  
**TCF Allowances for Refrigerated**  
**Warehouse Facilities per Man per Month**

Total Cu. Ft. (TCF) Allowances for Category Code 431-10:

**Type I Requirement:** Allows 4 cubic feet (CF) of perishable subsistence per man per month when fresh milk and bread are received monthly.

**Type II Requirement:** Allows 3 CF of perishable subsistence per man per month when fresh milk and bread are received at least every other day.

Type	Net Cubic Feet Per Man Per Month	Universal Factor**	TCF Allowances Per Man Per Month*		
			Total	Chill	Freeze
I	4	1.96	7.84	4.12	3.72
II	3	1.96	5.88	4.12	1.76

\* All allowances represent average values. If historical data are available that differ from these allowances, such data may be used for requirements planning if fully justified/documented.

\*\* See derivation of "Universal Factor" in appendix P 80X. This factor states, "1.96 TCF are required per cubic foot of material to be stored or 78.4 TCF are required per M/T of material to be stored."

## **440 GENERAL SUPPLY BUILDING**

### **440-1 DESCRIPTION**

This category group consists of supply-oriented covered storage and/or storage support facilities that are assigned to the Supply/Material Department or assigned for storage of operational mount-out stocks. Requirements allowance guidance can be found in the General Supply Planning Guidance under Requirements Determination.

### **440-2 DETERMINING GENERAL SUPPLY REQUIREMENTS**

This section provides information regarding the general methods used to calculate Basic Facilities Requirements (BFRs) for supply facilities.

#### **440-2.1 Definitions.**

440-2.1.1 **Cubic vs. Square Feet.** Requirements for supply operations and logistics facilities planning are first found in volume and then in the associated area, as opposed to area alone. This initial measure of volume is more commonly in cubic feet (CF) or measurement tons (MT). A MT is a logistics term that is often convenient to express a palletized or material unit load - and is equal to 40 cubic feet. The second general phase of a logistics requirement calculation is the translation of a given volume into area or square feet of facility required. This second phase is wholly dependent on an assumption of facility and storage system configuration as it interjects an available height or stacking height (SH). This is the height available to the storage function. The accommodation of a given volume requirement can vary with that of different stacking heights. That is, a given volume or cubic foot requirement translates into SF – X with SH – X and translates to SF – Y with SH – Y. This height is either that of an existing or planned building and/or system.

440-2.1.2 **BFR Qualification - Existing vs. Planned Facilities.** Supply operations' dependence on available stacking height requires a BFR to carry an assumption of SH that is either based on an existing building and system (status quo), an existing building with system upgrades (modernization) or a new building. It is, therefore, important that the BFR be qualified with the assumptions related to the respective SH (used to translate cubic feet to square feet of facility required).

440-2.2 **Calculation Methods.** BFRs may be calculated using either the analytical/4-step method or an operational space analysis method as the situation dictates.

440-2.2.1 **Analytical or 4-Step Method.** There are four steps required for determining storage space requirements by this method. This method is thought to be the preferred and most practical for use in planning up to and including the activity 1391 level or as needed to feed strategic planning.

**Step 1 - Total Cubic Feet.** Determine the total cubic feet (TCF) required for the CF or MT of material to be stored.

The first factor in the two part equation is determining a cubic feet (CF) or MT required by the user or user group. This cubic measure can be provided by the user (e.g., via records or expert knowledge of business forecast) or determined via a survey of existing operations coupled with an interview aimed at validating observations and forecasting any changes (i.e., survey observes 1 CF, interview relates 20% forecasted increase, requirement is 1.2 CF). A normal desired forecast for requirements is five years.



The second part of this two-part equation translates the raw volumetric measurement of required material into a CF requirement of the accommodating system or facility. This adjustment or translation accounts for the inherent losses in a storage system due to normal operations (various system and operational space losses). A universal factor has been derived and found to be 1.96 for CF and 78.4 for MT. That means that for 1 CF equates to 1.96 TCF required and 1 MT equates to 78.4 TCF required. This universal loss factor, 1.96, adjusts the raw material cubic measurement for various system and operational space losses. For example, 100 CF of raw material required translates to 196 TCF storage space required.

**Step 2 – Stacking Height.** Determine a stacking height (SH = available stacking height) value. For an existing facility use the current SH value. For a planned facility suggested SH's are shown in Table 440-1.

**Table 440-1 Suggested Stacking Heights for Planned Facilities**

Type of Storage	Stacking Height (FT)
Open Storage	4 – 10
MTIS, ILO, Outfitting Facilities	4 (without racks) Up to 12 (if racks are planned)
SERVMARTS	4 feet for display gondolas 7 feet for bin shelving
Covered Storage Facilities (other than above)	12
High-Rise Facility (planned available storage height above 12 feet)	Use the planned available storage height.

**Step 3 – Net Square Feet.** Determine the projected net square feet or NSF requirement by dividing the projected TCF required by the SH value determined in Steps 1 and 2 above.

**Step 4 – Gross Square Feet.** A NSF to gross square feet (GSF) multiplier of 2.5 or 2.0 should be applied to adjust for aisle, operational, handling and all spaces within the outer portion of the exterior walls defining the notional facility. Use 2.5 with the more common, large aisle operations that normally utilize sit-down, rider counter-balance material handling equipment and are characterized by the related ten to twelve

feet maneuvering aisles. Recommend using 2.0 in facilities with more dense, modern systems referred to as very-narrow aisle. These will be characterized by aisles of less than seven feet and often outfitted with vehicle guidance such as electronic wire or mechanical rail. Where this very-narrow aisle system cannot be verified or confirmed, 2.5 should be used.

**Alternative GSF Multiplier.** Alternatively to the net to gross factors described above, a more accurate SF to GSF multiplier can be calculated, through a notional facility layout that depicts actual floor space required for the rack or storage footprint (i.e., no aisles or collateral areas) and the resulting total facility. The ratio of total space to racked space is the SF per NSF multiplier. For additional assistance please contact the criteria manager.

**Additional Support Space.** The net to gross factors listed in this step are intended to accommodate some nominal area for material receiving, processing, staging and shipping areas associated with the operation. As such required support areas can vary widely, additional space may be added to the requirement 'bottom-line' to allow for a more active receipt and shipping operation. This additional space should be supported by and documented from operator input. If such additional processing space is expected to exceed fifteen percent of the total facility, the planner should consider it a separate category code as it may begin to address a transshipment operation that is related to, but additive to, the related storage requirement calculation. In any case it would be a separate and additive calculation to that arrived using the net to gross above. Such transshipment category codes would include 156-10 and 143-55.

**440-2.2.2 Operational Space Analysis Method.** This method for determining the BFR is prescribed as a more accurate process than that developed using the 4-step method. This Operational Space Analysis Method is expected for any BFR project support beyond the activity 1391 level.

**440-2.2.2.1 Total Cubic Feet.** The TCF for the operation would be determined as described in step one of the 4-step method above (paragraph 440-2.2.1.1).

**440-2.2.2.2 Operational Analysis Mapping.** An operational analysis that maps the planned operation within an existing or planned facility should then be used to determine the facility requirements. Using input from the operator, the space analysis should identify and quantify the key operational components such as: administrative,

receiving, shipping, storage, aisles. etc. It is expected that the material storage or staging portion of this analysis will include consideration and identification of storage and material handling systems. Note that each of these areas may be comprised of distinguishable components (i.e., storage can be bulk, palletized, rackable and binnable). As actual or planned SH's, aisle spacing, mechanical and miscellaneous spaces are used in this method, no related estimating metrics are required.

**440-2.2.2.3 Gross Area Requirement.** The sum of the planned areas (i.e., areas comprising the operation) form the gross area requirement - the BFR. It is expected that such an analysis would be supported by narrative and graphical documentation sufficient to convey the planned operational construct that has been coordinated with and approved by the user.

#### 440 - 2.3 **DISCUSSION OF CUBE RELATIONSHIPS.**

**440 – 2.3.1 Material Cube and the Measurement Ton.** The cube of material may be expressed in terms of several units of measure. However, cubic feet and Measurement Tons are the most commonly used in the Navy. A Measurement Ton (M/T) is a volumetric unit of measure defined as 40 cubic feet. An M/T of material can be configured in any shape. It can be visualized, for example, as 40 cubes of material measuring one cubic foot each. The cube of material in bin, rack and bulk storage areas is normally quantified in terms of cubic feet of material or M/Ts of material. The M/T is the preferred unit of measure in the Navy since it is the standard unit of measure used for shipboard cargo.

The following information may prove useful in estimating M/Ts of material in storage when no other data are available. A M/T of material is the appropriate average cube of pallet load of Navy shipment cargo on a standard Navy/DoD 40" x 48" pallet with a load height averaging 36", including pallet. The cube of an average Navy pallet load in storage is typically 0.8 M/Ts or 40" x 48" with a load height averaging 30", including pallet. The maximum pallet load height specified by Military Standard 147 is 54" (including pallet). A pallet load measuring 40" x 48" x 54" high (including pallet) equals 60 cubic feet or 1.5 M/Ts of material. The maximum cargo load size specified by Military Standard 147 on a 40" x 48" pallet (with material overhanging on pallet) is 43" x 52" x 54" high (including pallet). A load measuring 43" x 52" x 30.9" high (including pallet) equals 40 cubic feet or one M/T.

440-2.3.2 **Total Cubic Feet and the Universal Factor.** The Universal Factor provides for the determination of Total Cubic Feet required based on the cubic feet or M/Ts of the material to be stored. The Universal Factor allows 1.96 cubic feet of space for every cubic foot of material that is to be stored, i.e., a ratio factor of 1.96 to 1 applies. This can also be stated as a ratio factor of 78.4 to 40 if both the "1.96" and the "1" are multiplied by 40. The Universal Factor can thus be stated in either one of two ways, i.e., "1.96 TCF are allowed per M/T of material to be stored" or "78.4 TCF are allowed per M/T of material to be stored." The term Universal Factor is used because it applies equally to bin, rack and bulk storage areas. That is, it applies to all TCF in SA Facilities. This is an extremely convenient factor for determining storage space requirements since it means that TCF can be determined, on the basis of M/Ts or cubic feet of material to be stored, without regard to whether bin, rack or bulk facilities are or will be used to satisfy the requirement. Thus, the function of determining the BFR for TCF can be completely separated from the function of facility layout, equipment selection, comparative cost analysis and integrated systems development.

#### 440-2.4 **References.**

440-2.4.1 **NAVSUP Publication 529 – Warehouse Modernization & Layout Guide.** This reference is somewhat dated, but the guidance is valid regarding the layout planning related to modernization or new construction of warehousing facilities. This remains a significant publication to that end, but should be used in conjunction with some professional logistics engineering input for any purpose beyond initial activity level 1391 preparation.

440-2.4.2 **DLAM 4145.12 – Joint Services Manual (JSM) for Storage and Materials Handling.** This manual provides detailed guidance on storage and handling of material at DoD installations, by material type. While geared towards operations guidance, this information is critical to some correct planning by providing storage assumptions that impact spatial requirements.

440-2.4.3 **UFC 4-442-01N & MIL-HDBK-1032/2.** The developing UFC and the MIL HDBK which is its primary text, provide guidance on the design of covered storage facilities. It is of particular interest to planners as it provides information that is relevant to any plans (scope) for modernization or construction, including facility and site layout guidance.

### 440-3 **REGIONAL PLANNING FOR SUPPLY**

The application of requirements guidance in a regional planning perspective is meant to identify and exploit opportunities for optimizing facility use. This optimization goal of planning analysis is implied in regionalization (i.e. seeking regional economies of scale) and requires the planner to view the sum of all available assets in their aggregate, wherever practical. It is in this aggregate view of assets that a requirements summary in cubic feet is best translated into an optimal configuration in square feet. In other words, the question of a regional planning exercise is: "What is the most efficient accommodation of my cubic foot requirement within the existing or planned square footage (facilities & systems)?" For additional information on applying this criteria in a regional perspective, contact the criteria manager via e-mail.

#### **441 10 GENERAL PURPOSE WAREHOUSE (SF)**

**FAC: 4421**

**BFR Required: Y**

44110-1 **DESCRIPTION.** This code includes general warehouses with the following characteristics: heated or unheated and with/without heavy-duty (overhead crane) capability, sprinkler systems and/or alarm systems. The purpose of related missions is to provide all or some combination of materials staging or storage, handling and processing, receipt and shipping.

44110-2 **REQUIREMENT.** The general warehouse provides covered space for bulk and in storage, aisle space, space for receiving, packing and crating, office space for direct warehouse supervision (non-administrative) and toilet facilities.

#### **441 11 GENERAL PURPOSE WAREHOUSE, MARINE CORPS DSSC (SF)**

**FAC: 4421**

**BFR Required: Y**

44111-1 **DESCRIPTION.** This category code includes requirements for Marine Corps ground activities which have been designated by Marine Corps Orders as Direct Support Stock Control activities or which have specialized DSSC functions.

44111-2 **REQUIREMENT.** For new activities, Table 44111-1 may be used for requirements development. The guidance related to 440 series requirements development found in General Supply Planning Guidance under Requirements Determination, is otherwise recommended. If the 10-foot stacking height (SH) used in Table 44111-1 is not applicable, you may reduce the SF proportionate to the increase in SH as a conservative approximation (e.g., if SH is 20 feet vs. 10 feet, 330,000 SF would translate to 165,000 SF). For DSSC mission, include military strength of the base in question plus the military strength of other locally supported units. Non-DSSC activities use only the military strength of the base at which located.

**Table 44111-1 Storage Space for DSSC Functions**

<b>Installation Military Strength</b>	<b>SF Allowed with SH of 10 feet</b>
Up to 500	7,500
501 to 1,000	14,000
1,001 to 3,000	36,000
3,001 to 5,000	64,000
5,001 to 7,000	96,000
7,001 to 10,000	125,000
10,001 to 15,000	182,000
15,001 to 20,000	216,000
20,001 to 25,000	286,000
25,001 to 30,000	304,400
30,001 to 35,000	333,000

## **441 12 STORAGE OF AIR OR GROUND ORGANIC UNITS FOR MARINE CORPS (SF)**

**FAC: 4421**

**BFR Required: Y**

44112-1 **DESCRIPTION.** This category code includes general purpose storage facilities assigned to Marine Corps bases, air installations and Fleet Marine Force (FMF) units for organic requirements to include Division/Wing, Battalion/Group and Company/Squadron storage areas, Special Service storerooms, base shipping and receiving functions and any other organic storage requirements.

## **441 13 SPECIFIC PURPOSE WAREHOUSE, MARINE CORPS LOGISTICS SUPPORT BASE (SF)**

**FAC: 4411**

**BFR Required: Y**

44113-1 **DESCRIPTION.** This facility includes general-purpose warehouses designated as storage areas for Marine Corps owned material in support of logistic

support base mission as Integrated Material Managers. Also included is the space utilized in support of pre-positioned war reserve stocks.

**441 14      SPECIFIC PURPOSE WAREHOUSE, MARINE CORPS  
SUPPORTED ACTIVITY SUPPLY SYSTEM (SASSY)  
MANAGEMENT UNIT (SF)**

**FAC: 4411**  
**BFR Required: Y**

44114-1      **DESCRIPTION.** This facility includes general-purpose warehouses designated for support of the Supported Activity Supply System (SASSY) management units to include general and mount out accounts and consolidated issue point assets.

**441 20      CONTROLLED HUMIDITY WAREHOUSE (SF)**

**FAC: 4424**  
**BFR Required: Y**

44120-1      **DESCRIPTION.** A Controlled Humidity Warehouse is similar to a General Warehouse (441 10) in every respect except that it is constructed with appropriate vapor barriers and contains humidity control equipment to maintain humidity at desired levels. This warehouse may be a separate building or contiguous with a General Warehouse. See Figure 44120-1 for some examples of requirements that justify a controlled humidity warehouse.

**Figure 44120-1. Examples of Justifying Requirements**

1. Readiness and immediate issue requirements dictate a low humidity environment for moisture sensitive material.
2. A low humidity environment is required to maintain the condition of material being held in temporary storage while awaiting repair, disposition, preservation or assembly of components.
3. A low humidity environment is required to allow a reduction in reactivation time and/or reactivation cost of moisture sensitive material in storage.

**441 30      HAZARDOUS AND FLAMMABLES STOREHOUSE**

**FAC: 4423**  
**BFR Required: Y**

44130-1      **DESCRIPTION.** A hazardous materials warehouse is required for the storage and handling of materials such as flammable and combustible liquids, acids,

oxidizers, poisons, water reactive materials, caustics and organic peroxides. As safe storage of such materials lies in their separation from incompatible materials, a hazardous and flammables storehouse is required as much for adequate material separation as for their storage and handling. Such separations are normally accommodated via separate rooms. Incompatible material separation accommodations will also extend to the planning and design of containment of affluent run-off basins (i.e., in case of sprinkler event). A hazardous materials warehouse will also be equipped with fire protection and ventilation (i.e., harmful or flammable gases) in accordance with National Fire Protection Association (NFPA) standards. Site evaluation of a proposed or existing hazardous materials storehouse should be done in careful consideration to compatibility with adjacent properties, facilities or operations. Due to the compartmentalized layout of such facilities, their proper planning or planning related evaluation is sensitive to a working understanding of proper facility layout and design. Information on warehouse design and sample storage segregation layouts can be obtained from UFC 4-440-01 Warehouses and Storage Facilities.

44130-2      **STORAGE OF GAS BOTTLE CYLINDERS AND DRUMMED POL.**  
Storage of bottle gas cylinders and drummed petroleum, oils and lubricants (POL) are not planned for storage in flammables/hazardous warehouses and should be included in shed space, category code 441 35.

#### **441 35      GENERAL STORAGE SHED**

**FAC: 4422**

**BFR Required: Y**

44135-1      **DESCRIPTION.** The general shed is a roofed structure without complete side and/or end walls and with or without sprinkler and/or alarm systems. Examples of material stored in sheds include gas cylinders, vehicles, unfinished lumber and other construction material. Considerations for the applicability of such facilities are based on the relative need for protection from expected area weather conditions.

#### **441 40      UNDERGROUND STORAGE (SF)**

**FAC: 4421**

**BFR Required: Y**

44140-1      **DESCRIPTION.** Where it is necessary, because of potential sabotage or enemy action to protect supplies either by dispersal or protective construction, instead of programming new protective construction, existing mines may be used. Suitable mines for this purpose include: limestone, marble, quartzite, granite, gold, silver, uranium, lead, zinc and copper.

44140-2      **REQUIREMENT.** Only draft-type entries should be considered. Rooms should not be less than 30 feet wide or less than 12 feet high. Optimum dimensions are 500 feet wide and 18 feet high.



**441 70 DISPOSAL SALVAGE SCRAP BUILDING (SF)****FAC: 4421****BFR Required: Y**

44170-1 **DESCRIPTION.** This facility is primarily to provide covered space for the receipt, processing, staging and issue of material that has been deemed excess to Navy needs and is awaiting some resale or final disposal. To the extent practical, such operations are expected to use efficient storage practice as with a ready issue material warehouse. Where the warehousing analogy is accurate, the requirements development for this category should follow those of 441 10.

**441 71 INTEGRATED LOGISTICS OVERHAUL (ILO) AND  
OUTFITTING BUILDING (SF)****FAC: 4421****BFR Required: Y**

44171-1 **DESCRIPTION.** This facility provides covered supply space used for processing materials offloaded from or assembled for loading aboard ships. It includes space required for receiving, sorting, identifying and processing materials off-loaded as well as processing and assembly of outfitting materials to be loaded aboard fleet units.

44171-2 **REQUIREMENT.** Since the performance of this operation is primarily a function of facility floor space and not stacking height (SH), the determination of requirements is not first one of cubic feet. This operation is not characterized by a significant storage requirement and is not, therefore, dependent on a facility height. These operations are, however, dependent on a case specific estimate of peak and average operational tempo, processing times, and the related summary of material and operational floor layout requirements. A requirement should be developed using a related space analysis. If an existing operation is present, its floor space can be used as a 'baseline' measure from which to determine requirements through documented interview with the operators. This interview would be designed to forecast operational needs and adjust the baseline accordingly.

**441 72 SERVMART (SF)****FAC: 4421****BFR Required: Y**

44172-1 **DESCRIPTION.** A SERVMART provides covered supply facilities used for display and sale of supply systems materials for self-service requisitioning by end users. It includes areas used to display items on shelves or gondolas, checkout counters and

administrative functions. This category excludes back-up storage areas; requirements for such areas must be based on SH values and are carried under other basic category 441 codes.

44172-2 **REQUIREMENT.** Since the performance of this operation is primarily a function of facility floor space and not stacking height (SH), the determination of requirements is not first one of cubic feet. These operations are, however, dependent on an analysis that accounts for stocked items (i.e. number & type), their stock depth and their retail shelving floor layout. A requirement should be developed using a related space analysis. If an existing operation is present, its floor space can be used as a 'baseline' measure from which to determine requirements through documented interview with the operators. This interview would be designed to forecast operational needs and adjust the baseline accordingly.

### **441 73 MTIS BUILDING (SF)**

**FAC: 4421**

**BFR Required: Y**

44173-1 **DESCRIPTION.** A Material Turned Into Store (MTIS) Facility provides covered supply space used for processing materials turned into supply for redistribution or disposal. It includes space used for receipt, screening, identification, assembly and staging for return to storage areas.

44173-2 **REQUIREMENT.** Since the performance of this operation is primarily a function of facility floor space and not stacking height (SH), the determination of requirements is not first one of cubic feet. This operation is not characterized by a significant storage requirement and is not, therefore, dependant on a facility height. These operations are, however, dependent on a case specific estimate of peak and average operational tempo, processing times, and the related summary of material and operational floor layout requirements. A requirement should be developed using a related space analysis. If an existing operation is present, its floor space can be used as a 'baseline' measure from which to determine requirements through documented interview with the operators. This interview would be designed to forecast operational needs and adjust the baseline accordingly.

### **451 10 OPEN STORAGE AREA (SY)**

**FAC: 4521**

**BFR Required: Y**

45110-1 **DESCRIPTION.** This category group consists of non-covered storage areas, paved or otherwise established, for storage of General Supply Materials. Several of the excluded types of functions include miscellaneous materials coded under other

basic category codes (e.g., ammunition on open pad coded under 425-10 and open storage areas for non-supply oriented functions coded under 425 11).

45110-2 **REQUIREMENT.** Unless known to be otherwise, a stacking height (SH) of 4 feet should be used in accordance with the Basic Facilities Requirement (BFR) 4-step method described in the requirements section of this guidance. An estimation of material requirements, likely lay-down scenario (i.e., how material is stowed on area) and material handling equipment access is also acceptable as a means of determining square foot (SF) requirements via a space analysis.

## **451 70      EXTRAORDINARY SUPPORT – DISPOSAL - STORAGE                  AREA (SY)**

**FAC: 4521**

**BFR Required: Y**

45170-1 **DESCRIPTION.** This code refers to open areas primarily to provide space for the receipt, processing, staging and issue of material that has been deemed excess to Navy needs and is awaiting some resale or final disposal and whose value is not significantly impacted by uncovered exposure to the environment. This code may also be used for such open yards required for staging or storage of items being held for their scrap value to ongoing missions or systems.

45170-2 **REQUIREMENT.** To the extent practical, such operations are expected to use efficient storage practice as with a ready issue operation. There are no metrics that can serve to guide an allowance for this operational requirement. A SH of 4 feet should be used in accordance with the BFR 4-step method described in the requirements section of this guidance. Otherwise, an estimation of material requirements, likely lay-down scenario (i.e., how material is stowed on area) and material handling equipment access may also be used in a space analysis to determine requirements.

## 500 SERIES MEDICAL FACILITIES

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## **500 MEDICAL FACILITIES**

### **500-1 GENERAL**

The Office of the Assistant Secretary of Defense Health Affairs (OASD (HA)) has primary responsibility for establishing functional space criteria and standards for medical facility programs necessary to fulfill the Secretary of Defense's responsibilities. The medical program is funded by the Assistant Secretary of Defense, Health Affairs (OASD (HA)); which provides annual programming guidance, performs defense-wide health care facility planning, project programming, reviews and adjusts projects for scope and cost. Using the OASD (HA) criteria, the Office of the Navy Surgeon General (BUMED) programs all medical projects for the Navy. OASD (HA) also presents medical programs to OSD and the Congress for MILCON and UMC approval.

### **500-2 POLICY**

This section provides general guidance for planning of Military Healthcare facilities. All Military Healthcare facilities shall be planned with the Department of Defense (DoD) objective to provide facilities that are responsive to the functional requirements of the using Military Department. Joint utilization of military healthcare facilities and medical resources available in the civilian community must be considered in planning healthcare facilities. All medical facilities including medical and dental treatment facilities (MTF's), medical training facilities, medical research facilities, and veterinary treatment facilities should meet the operating requirement and should provide reasonable flexibility to accommodate future changes. The facility should be functional as well as aesthetically pleasing, while still being economical with a practicable life-cycle-cost. The facility must meet the necessary environmental requirements including applicable federal, state, and local environmental standards and criteria.

The Military Healthcare System space planning has two fundamental objectives. Within each objective, there may be multiple levels of determination. The first objective is to develop specific functional area space based upon environmental inputs. Functional areas are driven from a set of environmental inputs. The environmental inputs are defined to indicate demand for space (e.g. program obligations, activity requirements, staffing and equipment). The four major categories of space criteria are patient care, support of patient care, administration, and support of administration. To determine the Program for Design, the environmental inputs are translated into a set of specific space criteria.

The Bureau of Medicine and Surgery (BUMED), subject to approval of the Assistant Secretary of Defense for Health Affairs (OASD (HA)), is responsible for making the ultimate determination of scope and size of Naval Healthcare facilities to be planned, programmed, and constructed for major and minor projects. The following steps are a guide to Healthcare Planning.

**Note:** BUMED activities will be the maintenance UIC for all facilities they occupy entirely in direct support of their mission or are the preponderant user. Stand-by/emergency electrical generation, operational fuel storage of the generators or building heat systems and electrical transformers in direct support of the medical facilities should have the BUMED activity as the User and Maintenance UIC. The BUMED facility is not a complete and useable facility without the inclusion of these directly supporting utility systems.

The Healthcare facility and local planner will coordinate with the BUMED Echelon 3 Commands (NME, NMW, NCA, and NMSC) to identify projects to BUMED, Director of Facilities (M4B1), Installations and Logistics as potential MILCON or UMC candidates. BUMED will identify projects to TMA as potential MILCON or UMC candidates for approval.

The Healthcare facility Commanding Officer shall coordinate with the Lead Agent and their BUMED Echelon 3 command for the development of a project-specific Concept of Operations and integrated market-driven business plan. The elements of the business plan should include, but are not limited to:

- Delivery of the TRICARE health benefit to the population enrolled to the Military Treatment Facility (MTF)
- Provision of care to selected beneficiaries to maintain readiness skills
- Clinical competencies to maximize the utilization of the facility after the needs of TRICARE Prime enrollees have been satisfied
- Develop and implement joint programs in multi-service market areas
- Identify and develop sharing initiatives with VA
- Manage the care of all MTF Prime enrollees under Revised Financing and a Basic Facility Requirement (BFR)
- Planning tasks related to project identification and formulation will be programmed and funded from other than MILCON appropriations

The BUMED Echelon 3 command Project Officers shall coordinate with the medical activity to develop DD Form 1391 and provide all supporting documentation on the medical requirements at the installation, and assist the medical activities in obtaining project validations. The BUMED Echelon 3 commands will also coordinate with the installation to provide information systems requirements and cost estimates to integrate the information systems with the installation and the activity.

The BUMED Echelon 3 command Project Officers will develop explicit planning documents for future year projects, including a Healthcare Requirements Analyses (HCRA), Economic Analyses (EA), Construction cost analyses, Make-versus-Buy Analysis, and Program for Design. Each medical MILCON project is unique and circumstances may warrant modification to the guidelines provided. The analyses will normally require the assistance of outside contractors. One or all of the listed documentation may be required.

The BUMED Echelon 3 command Project Officer, Medical Consultant, outside contractor or A/E Firm will forward all completed documentation (i.e. Project Book, HCRA EA, and DEFTAB) to BUMED Facilities (M4B1) for review. BUMED will coordinate with M3 Operations Directorate for review. BUMED will then forward the required documentation to OASD (HA) for review and approval. Once approved, OASD (HA) will issue a DA to the Design/Construction Agent (NAVFAC/Army Corps of Engineers) to proceed with the Project.

**500-3 FACILITY DESIGN**

The following conversion factors shall be used in programming a Navy Healthcare facility. A net to gross conversion ratio for each department shall be calculated separately. The following steps are required to determine the net area for each department:

General Methodology:

1. Apply the specific net/gross ratio specific for each department.
2. Add all the department gross areas together.
3. Add the additional net/gross conversion factors to determine the overall building gross area.

Listed below are the department net/gross conversion ratios:

**Table 500-1  
Department Net/Gross Ratio**

<b>Administration</b>	<b>Net / Gross Ratio</b>
General Administration	1.40
Medical and Patient Libraries	1.35
Education and Training	1.35
Information Management	1.35
Patient Administration	1.35
<b>Outpatient Services</b>	
Primary Care/Family Practice	1.35
Pediatrics	1.35
Flight Undersea Medicine and Readiness	1.35
Emergency Services	1.35
Women's Health	1.35
Wellness Clinic	1.25
Occupational Therapy	1.30
Physical Therapy	1.30
Audiology / Speech	1.35
Specialty Surgical Clinics	1.35
Orthopedics / Podiatry	1.35
Ophthalmology/ Pulmonary Services	1.35
Allergy / Immunization	1.35



Mental Health	1.35
Preventative/Occupational Medicine	1.35
Dental Clinics	1.35
<b>Inpatient Services</b>	
Nursing Units	1.50
Labor and Delivery/ OB Unit	1.50
Nursery	1.45
Surgery	1.60
<b>Support Ancillary Services</b>	
Food Service	1.35
Logistics	1.25
Pathology	1.25
Radiology / Nuclear Medicine	1.50
Pharmacy	1.25
Vet services	1.35
Chapel	1.20
Patient Services	1.35
Clinical Investigation	1.35

After all the department totals are calculated and totaled, the additional net/gross ratios need to be added. Listed below are the building net/gross conversion ratios, based on building type:

**Table 500-2  
Net To Gross Square Feet Calculations**

<b>Allowances/ Categories</b>	<b>Medical/ Dental Clinics</b>	<b>Ambulatory/ Health Care Facility</b>	<b>Station/ Community Hospital</b>	<b>Regional Medical Centers</b>
MECHANICAL SPACE	13.50%	14.5%	15.0%	16%
ELECTR. SPACE	2.0%	2.0%	3.0%	3.0%
CIRCULATION	14.0%	15.0%	15%	16%
HALF AREAS	1.5%	1.5%	1.5%	1.5%

**Notes:** For addition/alteration projects, up to 15% of the total altered net space may be added to the flexibility allowance to offset physical constraints in the existing facility. This increased allowance must be validated during design.

1. Buildings with multiple floors may need additional circulation ratios for stairs, elevators, etc.
2. For facilities with emergency power systems, other than Hospitals and Regional Medical Centers, increase electrical from 2.0% to 3.0%. Hospitals and Regional Medical Centers have a percentage that already assumes that emergency power systems are required.

3. Communication/network server spaces shall be programmed in Section 2.4: Information Management and throughout all departments.
4. Add 25% to mechanical areas for projects in Germany (requires all floor mounted equipment).
- 5 Add 8% to circulation areas for projects in Germany (natural daytime lighting requirements).

## **510 HOSPITAL AND OTHER MEDICAL TREATMENT FACILITIES**

### **510 10 HOSPITAL (BD)**

**FAC: 5100**

**BFR Required: Y**

51010-1 **GENERAL.** A Healthcare facility that provides general and specialized medical care for authorized personnel, with both inpatient and outpatient services. This facility will also normally contain clinics, such as Medical, surgical, pediatrics, obstetrical, ICU and CCU. The facility will have a Pharmacy, ambulance, and administrative area. This facility will admit for more than 24-hour stay.

### **510 11 MEDICAL CENTER (SF)**

**FAC: 5100**

**BFR Required: Y**

51011-1 **GENERAL.** A regional medical center. These facilities support both increased surgical capabilities and a surgical graduate education program, not required in smaller hospitals. Applies to Bethesda, Portsmouth and San Diego (Balboa).

### **510 12 PRE-POSITIONED FLEET HOSPITAL WAREHOUSE (UNASSEMBLED) (EA)**

**FAC: 5306**

**BFR Required: Y**

### **510 15 HOSPITAL BRANCH / ANNEX (BD)**

**FAC: 5100**

**BFR Required: Y**

### **510 16 MEDICAL ADMINISTRATION (SF)**

**FAC: 6100**

**BFR Required: Y**

51016-1 **GENERAL.** A building or space that provides administrative support for medical, dental or veterinary functions that is physically located outside of a defined hospital or clinic facility. Types of functions would include, but not limited to, TRICARE management, resource management, patient administration, medical command

personnel. Medical administrative personnel provide essential work for the accomplishment of the medical mission. These individuals do not counsel, diagnosis, examine or treat patients. This category does not serve as headquarters space for command level units. Reference the following for space planning:

[https://www.wbdg.org/FFC/DOD/MHSSC/ARCHIVES/spaceplanning\\_healthfac\\_25\\_2006.pdf](https://www.wbdg.org/FFC/DOD/MHSSC/ARCHIVES/spaceplanning_healthfac_25_2006.pdf).

## **510 20 HOSPITAL LAUNDRY (SF)**

**FAC: 5100**

**BFR Required: Y**

## **510 77 HOSPITAL MEDICAL STORAGE (SF)**

**FAC: 5306**

**BFR Required: Y**

## **530 LABORATORIES**

### **530 10 DISPENSARY AND OUTPATIENT CLINIC (SF)**

**FAC: 5500**

**BFR Required: Y**

53010-1 **GENERAL.** Free Standing Clinic, outpatient clinic, which occupies a building or part of a building, but is not physically located with a hospital or medical center that provides routine and emergency care to authorized personnel.

### **530 20 MEDICAL LABORATORY (SF)**

**FAC: 5302**

**BFR Required: Y**

53020-1 **GENERAL.** A facility, detached from a hospital that provides laboratory support to the hospital and/or other medical activities. The analysis and diagnostic laboratory includes chemistry, diagnostics and microbiology testing sections and a quality assurance and technical support section. Contact the Bureau of Medicine and Surgery (BUMED) or the appropriate BUMED Echelon 3 command when planning this facility.

### **530 25 PHARMACY (SF)**

**FAC: 5500**

**BFR Required: Y**

53025-1 **GENERAL.** A pharmacy building or space that dispenses medically prescribed drugs. This category is used for standalone buildings or to delineate functional areas within facilities located outside a defined hospital or clinic facility (for example Exchange, Commissary, etc.). Pharmacy areas within hospitals or clinics will

not be separately identified but will carry the same category code as the hospital or clinic. This category does not serve as headquarters space for command level units.

### **530 30 MORGUE (SF)**

**FAC: 5303**

**BFR Required: Y**

53030-1 **GENERAL.** A facility, either detached or within a hospital, for the identification, preparation, and holding of human remains.

### **530 40 VIVARIUM CLINIC (SF)**

**FAC: 5304**

**BFR Required: Y**

53040-1 **GENERAL.** The vivarium clinic is a medical research laboratory for keeping and raising animals and plants under natural conditions for observation and research. This clinic may also do biological defense and other research for war and peacetime protection. Contact the Bureau of Medicine and Surgery (BUMED) or the BUMED Echelon 3 command when planning this facility.

### **530 45 VETERINARY TREATMENT FACILITY (SF)**

**FAC: 5304**

**BFR Required: Y**

53045-1 **GENERAL.** This facility is used to provide food safety and quality assurance, care for government owned animals (working dogs and horses), and animal disease prevention and control. Veterinary services are to examine, immunize and treat for the prevention and control of diseases or conditions that are transmissible to humans or animals, or may constitute a military community health problem. Conditions that are not transmissible from one animal to another or to a human generally are not treated at this facility. A veterinary treatment facility (VTF) is equipped and staffed to perform the entire spectrum of veterinary services required by a military installation. A VTF includes offices for the veterinarian and section chiefs, conference room, library, food inspection room, waiting room, x-ray facilities, pharmacy, clinical laboratory room, inside rabies quarantine kennel rooms, inside-outside kennel area for hospitalized government owned animals, toilets and showers, employee lounge, locker and dressing rooms, linen room and storage space for records, supplies and cleaning equipment. Table 53045-1 provides space allowance for individual components of a Veterinary Treatment Facility. It should be noted that not all components may be required for each Facility.

**Note: Cat Codes 530-40 and 530-45 should be used when the tenant is an Army Veterinarian conducting food inspections. This is the only instance where it is a BUMED funding responsibility and requires the BUMED Activity as the Tenant / User and Maintenance UIC.**

For a veterinary clinic operated by MWR in support of the base populations' pet animals or for a military working dog (MWD) kennel, please use Category Code 730 76. These are not BUMED activities.

Table 53045-1

Type of Space	Net Square Feet
<b>I. Clinical Spaces</b>	
Exam. Rms.	120
Surgical Suite	200
Clean Utility Room	80
Dirty Utility Room	80
X-ray (incl. processing space)	250
Kennel (quarantine)	80
Pharmacy Store Room	120
Food Inspection Room and Laboratory	470
Clinic Laboratory Area	120
Stray Animal Confinement Kennels	10/40
Utility and Supply Area	150
Rabies Quarantine Kennels	40
Hospitalization Kennels	40
Utility Area for Kennels	140
Kennel Inside and Outside	60
<b>II. Support Spaces</b>	
Chief Veterinarian Office	140
Administrative Support Area	120
Reception Area and Control Area	140
Clinical Records Holding Area	50
Employees' Lounge	140
Patient Handler Waiting Room	200
Conference Room/Library	250

### **530 50 ENVIRONMENTAL PREVENTATIVE MEDICINE LABORATORY (SF)**

**FAC: 5302**

**BFR Required: Y**

53050-1 Criteria for this category code are currently being written.

### **530 60 MEDICAL WAREHOUSE (SF)**

**FAC: 5306**

**BFR Required: Y**

53060-1 **GENERAL.** A storage facility for medical equipment and supplies that is continuously withdrawn and replenished. Storage of war reserve medical supplies is included in depot storage facilities.

**530 70 AMBULANCE SHELTER (SF)**

**FAC: 5307**

**BFR Required: Y**

53070-1 **GENERAL.** A covered space used to shield the Ambulance, its driver and its patients from exposure to the elements.

**540 DENTAL CLINICS**

540-1 A dental clinic is an oral health care service facility equipped and staffed to perform dental procedures for general practices, a specialty, or a grouping of specialties. A dental facility will normally include treatment areas, administrative, support and storage areas.

**540 10 DENTAL CLINIC (SF)**

**FAC: 5400**

**BFR Required: Y**

54010-1 **GENERAL.** The Bureau of Medicine and Surgery (BUMED), subject to the approval of the Assistant Secretary of Defense (Health Affairs), is responsible for the determination of scope of dental clinics planned, programmed, and constructed. The following information is provided as a guide to be utilized for planning and preliminary programming purposes.

Step 1: Beneficiary Population. Determine the active duty beneficiary population. On average there will be 1 dental officer per 800 active duty beneficiaries.

Step 2: Staffing. Obtain staffing figures for the planning year from the Authorized Manpower documentation for the military personnel and the authorized positions for the civilian personnel. The planning documents must be submitted via the BUMED Echelon 3 to the BUMED Manpower Division (M1) for confirmation of support for any increased staffing, both military and civilian.

Step 3: Dental Treatment Rooms (DTR's). Determine the number of required DTR's from the following criteria.

- 1 DTR for each dentist in training.
- 2 DTR's for each general duty dentist assigned to clinical dentistry. 2 DTR's for each Prosthodontist, Periodontist, Endodontist, Oral Surgeon, Pedodontist, and Comprehensive General Dentist assigned to clinical dentistry.
- 3 DTR's for each Orthodontist.

NOTE: When the total number of dentists is five (5) or less, use a DTR factor of 2 DTR's per dentist Clinics with six (6) dentists will have a minimum of 10 DTR's.

- 1 Oral Hygiene Treatment Room (OHTR) for each oral hygienist or technician functioning as oral hygienist.

Step 4: Clinic Space Required. After calculating the number of DTR's required, consult table 540-10A to determine the gross area required. Interpolation is required. These figures include space allowance for all functions that are in direct support of the dental clinic, such as administration, locker rooms, conference rooms, limited prosthetic laboratory, storage of operating supplies, a central sterile and dental X-ray. This also includes waiting rooms, mechanical spaces, restrooms, circulation, walls and partitions, and consultation rooms. Interpolation, as explained at the front of the 500 series, is necessary.

**Table 54010-1  
Space Allowances for Dental Clinics**

Number of DTR's and OHTR's	Gross Area per DTR and OHTR (sq.m / GSF)
2	93 sq.m. / 1000 GSF
3	93 sq.m. / 1000 GSF
4	84 sq.m. / 900 GSF
6	84 sq.m. / 900 GSF
8	75 sq.m. / 800 GSF
10	75 sq.m. / 800 GSF
12	70 sq.m. / 750 GSF
18	70 sq.m. / 750 GSF
25	70 sq.m. / 750 GSF
30	65 sq.m. / 700 GSF
40	65 sq.m. / 700 GSF
50	65 sq.m. / 700 GSF
100	61 sq.m. / 650 GSF

Step 5: Optional Functions: (must be specifically justified and documented)

A. Dental Equipment Repair. For clinics with equipment repair technicians assigned, determine the number of repair technicians from Manpower Authorization and consult table 54010-2 to determine the gross area required.

**Table 54010- 2  
Space Allowance for Dental Equipment Repair Technicians**

Number of Repair Technicians	Gross Area - sq. m. / GSF
1	25 sq. m./ 270 GSF
2	46 sq. m. / 500 GSF

3	60 sq. m. / 650 GSF
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**Note:** Add 9 sq.m. (100 GSF) more for each additional repair technician.

B. Special Education Functions. Where specifically justified, an education training room can be planned based upon documentation of course title, frequency and duration of courses, and average on board students. A space factor of 2.6 sq.m. (28 GSF) per student will be used to size the facility based upon the average monthly student population that can be justified. Routine classroom/conference room functions are already included in table 54010-1.

C. Full Prosthetic Lab. If authorized and staffed with a full time prosthetic lab technician, additional space may be added for a full prosthetic lab. Consult table 54010-3 for the gross square area required.

**Table 54010- 3  
Space Allowance for a Full Prosthetic Laboratory**

Function	Gross Area - sq. m. / SF
Dental Prosthetic Lab	63 sq.m./ 675 GSF
Ceramic Room	19 sq.m./ 200 GSF
Casting & Grinding	19 sq.m. / 200 GSF
Model Storage	11 sq.m. / 120 GSF
<b>Each technician over 3</b>	<b>8 sq.m.each 85 GSF</b>

**Table 54010- 4  
Space Allowance for Regional Storage**

Number of Branch Clinics served	Gross Area – sq. m. / SF
Up to 5	19 sq. m. / 200 GSF
6 to 10	65 sq. m. / 700 GSF
11 to 20 ( maximum allowable)	93 sq. m. / 1000 GSF

Step 6: Total Gross Square Footage Required. Add the gross square footage for the clinic obtained in step 4 to the gross square footage of the supported options obtained in step 5. The sum is the total space requirement for category code 540-10 and includes all functions that are normally associated with a Dental Clinic.

Step 7: Parking. Based on the 15 Oct 1991 MIL-HDBK-1191 (DOD Medical and Dental Treatment Facilities Design and Construction Criteria), for clinics with less than 30 DTR's, provide 3 parking spaces per DTR For larger clinics, 2.5 spaces per DTR should be planned. One space per organizational vehicle is also authorized.

Step 8: Site Selection. Site facility convenient to active duty beneficiaries. Collocation of Dental Clinics with Medical clinics is operationally efficient and desired. In site selection, provide a minimum of 25% expansion capability of the facility square meters, as calculated in step 6, & parking requirements, calculated in step 7. Facility should be sited convenient to existing utility support.



## **550 DISPENSARIES/ CLINICS**

### **550 10 PRIMARY CARE CLINIC (SF)**

**FAC: 5500**

**BFR Required: Y**

55010-1 **GENERAL.** A primary care clinic may be referred by various names (troop medical clinic, adult clinic, family practice clinic, OCC Health, Outpatient, and others). A primary care clinic provides the office, examination and treatment space for "primary care managers".

### **550 20 AMBULATORY CARE CENTER (SF)**

**FAC: 5501**

**BFR Required: Y**

55020-1 **GENERAL.** A health care facility capable of performing outpatient surgical procedures and other medical treatment, not requiring extensive patient convalescence or overnight observation.

### **550 30 REHABILITATION CENTER FOR DRUGS AND/OR ALCOHOL (SF)**

**FAC: 5500**

**BFR Required: Y**

55030-1 This facility will provide the necessary administration, counseling, training, berthing, and recreation for rehabilitation of eligible Navy, Marine Corps and other personnel suffering from alcoholism, drug dependency and/or compulsive overeating.

55030-2 A typical Alcohol Rehabilitation Center (ARC) is composed of three major components which are: Berthing, Administration, and Operational Support area. The berthing requirements for all patients are based upon the criteria for category code 721-14, Bachelor Housing - Class A Student Barracks in order to be compatible and consistent with the Navy's treatment modality of group therapy. Each "group sized" bay or module will accommodate 12 beds and an appropriately shared head/shower. Identical berthing modules for female patients should be provided in a separate and distinct location. The number of modules required varies with patient load. A 120 patient facility requires 12 12-bed modules; the apparent extra modules are required to accommodate female patients, patients awaiting transportation and any group overflow.

55030-3 The Administration requirements are derived by using the criteria established for category code 610-10, Administration, keeping in mind that administration includes both command oriented and patient affairs.

55030-4 The Operational Support Area is composed of all those remaining facilities required for the ARC to accomplish the assigned mission. Included within this area is sufficient space for the following types of functions: group therapy rooms, some with discreet observation capability; multi-purpose room, large enough to accommodate entire facility population; a visitors lounge with some privacy; traditional classrooms with audiovisual capability; library; patients lounge; secure medical exam room and a small laboratory capability; and storage space. A planning factor of 18 square meter (190 gross square feet) per patient is used to provide for these facilities. In the event that no parking is available, the criteria for category code 852-10, Parking Area, is used to determine the parking space requirements for the organizational and non-organizational vehicles.

55030-5 The following example illustrates the methodology used to determine the space requirements for a typical ARC treating 120 patients and having a staff complement of 50 personnel.

**Table 55030-1**

ARC	Component	Gross Area	
		Square Meter	Square Foot
Berthing—Class A Student (Cat Code 721-14):	120 patients x 7 sq.m. (75.3 sf)/patient =	840	9,307
Net to gross conversion = (Includes lounges, general circulation, mechanical space, etc.)	1.71 X 840 sq.m. (9,037 sf) =	1,436	15,453
Administrative Office (Cat Code 610-10):	14 sq.m. (162.5 gsf) X 50 personnel =	700	8,125
Operational Support Area:	120 patients X 190 gsf per patient =	2,119	22,800
	<b>Total ARC Space</b>	5,095	55,685
Parking	Component	Square Meter	Square Yard
Non-Organizational			
Admin = 50 pn X 60% (factor)	35 spaces		
Patient = 120 pn X 75%	90 spaces		
	Total: 125 spaces @ 33 sq.m. (39.5 sq.yds.) =	4,125	4,933
Organizational			
Vans = 10 pn x 75%	8 spaces @ 33 sq.m. (39.5 sq.yds.) =	264	316
	<b>Total Parking Space</b>	4,389	5,249

**NOTE:** These planning factors are the maximum space allowances for this type of facility. Smaller areas are permitted as appropriate. However, in all cases, the berthing requirements must conform to the Class A Student space requirement as given in the criteria for category code 721-14, Bachelor Housing.

**FACILITIES CRITERIA (FC)**  
**FACILITY PLANNING FOR NAVY AND**  
**MARINE CORPS SHORE INSTALLATIONS**

**Series 600: Administrative Facilities**

**Record of Changes:**

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Change Description</b>
Sept 2013	61010	ADMINISTRATIVE OFFICE	For simple BFRs, a <u>maximum</u> Admin GSF/PN allowance of 162.5 GSF/PN applies. This allowance includes office space, admin support space, break room space, conference/training room space and a net-to-gross factor of 1.25.
July 2019	61010	ADMINISTRATIVE OFFICE	Continue to use a <u>maximum</u> Admin GSF/PN allowance of 162.5 GSF/PN. For simple BFRs, a net-to-gross factor of 1.40 now applies. For project level BFRs, use the Admin BFR Generator to calculate the actual Admin GSF/PN allowance and Net-To-Gross factor.
Feb 2021	61010	ADMINISTRATIVE OFFICE	Section 61010-11 added to account for Telework and Workspace Sharing. Use section 61010-11 in tandem with Admin BFR Generator.
April 2022	61040	LEGAL SERVICES FACILITY	In Table 61040-1 Space Allowance for Legal Services Facilities, change Paralegal square footage per person from 64 NSF to 110 NSF.
May 2022	61010	ADMINISTRATIVE OFFICE	In Table 61010-7.2, update “shower room” justification by including support if access to a fitness center is 5 minutes or greater by walking. Additional justification includes acknowledgement of military integrity and readiness.
28 Jul 2022	61010	ADMINISTERATIVE OFFICE	Admin. BFR Generator in Excel format mad available for download. This includes various updates.
2 Mar 2023	600 Series	UFC 2-000-05N	Change UFC 2-000-05N to FC 2-000-05N document due to the fact that this planning criteria is not unified among the other DoD services.

## SERIES 600 ADMINISTRATIVE FACILITIES

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## 610 ADMINISTRATIVE BUILDINGS

**610-1 DEFINITION.** A building that contains general office space, administrative support space, break rooms, and conference/training rooms. Other special purpose space types may apply.

### 610 10 ADMINISTRATIVE OFFICE (SF)

**FAC 6100**

**BFR Required Y**

61010-1 **DEFINITION.** An administrative facility is a building or portion of a building in which the administrative affairs of an organization are conducted. It accommodates the executive and staff functions of an installation or tenant organization. Administrative office space provided within non-administrative facilities under other category codes shall conform to the criteria provided herein.

61010-1.1 **BASIC PLANNING FACTORS.** There are two methods to determine administrative space requirements: Simple BFR Calculation and Project Level BFR Calculation.

- For simple Basic Facility Requirement (BFR) calculations, a maximum administrative (Admin) space allowance of 162.5 gross square feet per person (GSF/PN) applies. An Admin GSF/PN allowance includes all administrative workspace, administrative support space, break room space, and conference/training room space. Included in the 162.5 GSF/PN factor is a net-to-gross (NTG) factor of 1.40. This method is for rough order of magnitude estimates.
- For all project level BFR calculations, where multiple factors are considered (e.g. circulation, multiple stories, scale of economy, telework, workspace sharing, etc.), the maximum Admin GSF/PN allowance of 162.5 GSF/PN still applies, however; all space requirements and the NTG factor shall be calculated. Read sections below and use the online [Admin BFR Generator](#) to simplify this process.

*Note: The Admin BFR Generator has been tested with Chrome and Internet Explorer. If security settings prevent the link above from working, copy and paste following address into your browser:*

*Online version:*

[https://www.wbdg.org/FFC/DOD/UFC/600SERIES/BFR/Admin BFR Generator.htm](https://www.wbdg.org/FFC/DOD/UFC/600SERIES/BFR/Admin%20BFR%20Generator.htm)

*MS Excel version for download:*

[https://www.wbdg.org/FFC/DOD/UFC/600SERIES/BFR/Admin\\_BFR\\_Generator.xlsx](https://www.wbdg.org/FFC/DOD/UFC/600SERIES/BFR/Admin_BFR_Generator.xlsx)

**61010-2 Admin BFR Generator Quick Start Process.** Space requirements are calculated for administrative functions using the process below.

**Process:**

1. Begin on 'Activity' tab and input activity data.
2. Input number of personnel that require a private office, workstation type 1 (WST1) and/or workstation type 2 (WST2) space.
  - Note 2a. Private office spaces are justified for supervisory personnel.
  - Note 2b. WST1 spaces are justified for general staff personnel.
  - Note 2c. WST2 spaces are justified for personnel that predominantly telework.
3. Proceed to 'Space Table' tab and input space table fields if required.
  - Note 3a. Space types within the General Administrative Space and Basic Allocation Groups are used to calculate an 'Admin GSF/PN factor', which has a maximum allowance of 162.5 GSF/PN.
  - Note 3b. Space types within the Functional Support Group, Security Group and User Defined Group are used to calculate a 'Total GSF/PN' factor, which may exceed 162.5 GSF/PN.
4. Proceed to 'Justification' tab and input justification fields if required.
  - Note 4a. Space types within the General Administrative Space Group and Basic Allocation Group do not require justification.
  - Note 4b. Space types within the Functional Support Group, Security Group and User Defined Group do require justification.
5. Proceed to 'Net-To-Gross' tab and input net-to-gross fields if required.
  - Note 5a. If space loading is less than 50 PN, a Net-To-Gross (NTG) factor of 1.40 is automatically applied.
  - Note 5b. If space loading is equal to or greater than 50 PN, the NTG factor is calculated.
6. Proceed to 'Summary' tab, input summary data fields and 'Submit'.
  - Note 6a. The 'Submit' function checks to ensure all required data fields are populated. Once all required data fields are populated, the BFR is converted to PDF format and sent to the user via email.
7. Optional: Proceed to 'Telework' tab, and follow guidance in section 61010-11.
  - Note 7a. Requires completed Base Line scenario (steps 1-5 above)
  - Note 7b. Requires survey results in proper format, see section 61010-11.

**61010-3 Personnel Loading.** Personnel loading is the sum of all military, civilian and other personnel associated with an organization at a particular planning area and category code. Administrative BFRs shall be based on an official personnel loading source.

**61010-3.1. Official Personnel Loading Sources.**

61010-3.1.1. Activity certified personnel loading document

61010-3.1.2. Activity manning document

61010-3.1.3. Navy Total Force Manpower Management System

61010-3.1.4. Marine Corps Total Force System

61010-3.1.5. Other - If official reports are not available, certification of the personnel loading data used as a basis for BFR development must be provided by a responsible approval authority.

61010-3.1.6. SIMNavy can provide initial personnel loading reports, but must be certified by the tenant activity for accuracy. Website requires Chrome browser and user authentication. <https://fres.cnmc.navy.mil/SimNAVY/SimNavy.aspx>

**61010-3.2. Personnel Loading Year.** Personnel Loading Year refers to a particular fiscal year for which the projected staffing applies. For planning purposes, a five-year projection is applied.

**61010-3.3. Personnel Loading Types.** Personnel loading types include military, civilian and other personnel.

61010-3.3.1. Military personnel include all active duty personnel. Reserve personnel are justified on a case-by-case basis.

61010-3.3.2. Civilian personnel include all direct hire personnel.




61010-3.3.3. Other personnel include all contractor, foreign national and/or other miscellaneous personnel.

**61010-4. Space Loading.** Space loading is the sum of all personnel requiring private office, Workstation Type 1 (WST1) and/or Workstation Type 2 (WST2) space, associated with an organization at a particular planning area and category code. Personnel loading should be equal to space loading.

**61010-5. General Administrative Space.** General Administrative Space types are justified to support administrative or similar functions and include: private office spaces, WST1 spaces, WST2 spaces as well as secondary circulation space. As part of the General Administrative Space group, these space types are based on official personnel loading reports and do not require further justification. Tenant (personnel and/or space) loading reports must be provided as a separate attachment for project level BFRs.



Table 61010-5.1. **General Administrative Group Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Private Office	A private office provides an enclosed space, typically occupied by supervisory personnel or for those personnel whose job duties require privacy. Depending on an organization's telework and workspace sharing policies, this space type may be dedicated or shared. Private office space allocations typically range from 100-120 NSF/PN.	Allocate 120 NSF/PN requiring private office space	<ul style="list-style-type: none"> <li>The number of personnel requiring private office space is supported by an official personnel loading report.</li> </ul> 
WST1 (WS Type 1)	A WST1 is a modular workstation, typically occupied by general administrative or support staff. Depending on an organization's telework and workspace sharing policies, this space type may be dedicated or shared. WST1 space allocations typically range from 48-64 NSF/PN.	Allocate 64 NSF/PN requiring WST1 space	<ul style="list-style-type: none"> <li>The number of personnel requiring WST1 space is supported by an official personnel loading report.</li> </ul> 
WST2 (WS Type 2)	A WST2 is an optional space type, similar to WST1 modular workstation, but provides an alternate (usually smaller) size. It may serve as contractor space, hoteling space, or swing space during renovation projects. Depending on an organization's telework and workspace sharing policies, this space type may be dedicated or shared. WST2 space allocations typically range from 36-48 NSF/PN.	Allocate 48 NSF/PN requiring WST2 space	<ul style="list-style-type: none"> <li>The number of personnel requiring WST2 space is supported by an official personnel loading report.</li> </ul> 
Circulation	General administrative space secondary circulation includes the aisles between private office, WST1 and WST2 spaces. This circulation multiplier may range from 0.12 for all enclosed space (private offices) to 0.28 for all open office (workstation spaces)	Allocation is calculated using the Admin BFR Generator	<ul style="list-style-type: none"> <li>Space type does not require justification</li> </ul>

61010-6. **Net General Administrative Space.** Sum of all space types listed above including secondary circulation.

61010-7. **Special Purpose Space.** Special purpose space groups include:

1. Basic Allowance Group
2. Functional Support Group
3. Security Group
4. User Defined Space Group

61010-7.1. **Special Purpose Space – Basic Allowance Group.** As part of the Basic Allowance Group for administrative functions, these space types are based on official personnel loading reports and do not require further justification.

Table 61010-7.1. **Basic Allowance Group Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Administrative Support Space	Admin support space includes: <ul style="list-style-type: none"> <li>• Group file storage (as opposed to individual file storage provided within modular furniture)</li> <li>• Conference room</li> <li>• equipment storage (audio/visual equipment, chairs, lecterns, and room dividers)</li> <li>• Day locker storage (cell phones and other small personnel items)</li> <li>• Lactation room(s)</li> <li>• Office equipment and supply storage</li> <li>• Reception area(s)</li> </ul>	Allocate 8 NSF/PN	<ul style="list-style-type: none"> <li>• Basic Allowance Group space types are based on personnel loading and do not require further justification.</li> <li>• Note: The degree to which administrative support spaces may be applied is dependent on the number of personnel. For small groups (&lt;50 PN), this allocation may only include space for office equipment and supply storage only. For large groups (&gt;100 PN), this allocation may include all of the space types listed in the description.</li> </ul>
Break Room w/o Kitchen	A break room w/o kitchen is a staff-only space used for breaks or lunches. It typically includes some or all of the following: coffee bar, microwave oven, MWR drink/snack space, refrigerator and water cooler.	Allocate 2 NSF/PN	<ul style="list-style-type: none"> <li>• Basic Allowance Group space types are based on personnel loading and do not require further justification.</li> </ul>
Conference/Training Rooms	Conference/training rooms provide space for meetings, briefings and training. One overall space allocation is provided for conference/training rooms.	Allocate NSF based on: Conference/Training Room Table below	<ul style="list-style-type: none"> <li>• Basic Allowance Group space types are based on personnel loading and do not require further justification.</li> </ul>

Table 61010-7.1A. Conference/Training Room Table

Personnel Loading Ranges		Conf Rooms	Team Mtg/Mini Conf Room (5-10 PN) 15 NSF/PN			Conf Rooms	Conference Room (10 to 49 PN) 20 NSF/PN			Conf Rooms	Conference Room (50+ Persons) 20 NSF/PN plus 150 NSF spkr area			Total
LOWER	UPPER	QTY	PN	NSF/PN	NSF	QTY	PN	NSF/PN	NSF	QTY	PN	NSF/PN	NSF	NSF
0	9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	24	1	5	15	75	0	0	0	0	0	0	0	0	75
25	49	0	10	15	0	1	12	20	240	0	0	0	0	240
50	99	1	10	15	150	1	15	20	300	0	0	0	0	450
100	149	1	10	15	150	2	15	20	600	0	0	0	0	750
150	249	2	10	15	300	2	25	20	1,000	0	0	0	0	1,300
250	349	4	10	15	600	2	25	20	1,000	0	0	0	0	1,600
350	449	5	10	15	750	1	15	20	300	1	50	20	1,150	2,200
450	549	6	10	15	900	2	15	20	600	1	50	20	1,150	2,650
550	649	7	10	15	1,050	5	10	20	1,000	1	50	20	1,150	3,200
650	749	8	10	15	1,200	6	10	20	1,200	1	50	20	1,150	3,550
750	849	9	10	15	1,350	7	10	20	1,400	1	50	20	1,150	3,900
850	949	10	10	15	1,500	8	10	20	1,600	1	50	20	1,150	4,250
950	1,049	11	10	15	1,650	9	10	20	1,800	1	50	20	1,150	4,600
1,050	1,149	12	10	15	1,800	10	10	20	2,000	1	50	20	1,150	4,950
1,150	1,249	13	10	15	1,950	11	10	20	2,200	1	50	20	1,150	5,300
1,250	1,349	14	10	15	2,100	12	10	20	2,400	1	50	20	1,150	5,650
1,350	1,449	15	10	15	2,250	13	10	20	2,600	1	50	20	1,150	6,000
1,450	1,549	16	10	15	2,400	14	10	20	2,800	1	50	20	1,150	6,350
1,550	1,649	17	10	15	2,550	15	10	20	3,000	1	50	20	1,150	6,700
1,650	1,749	18	10	15	2,700	16	10	20	3,200	1	50	20	1,150	7,050
1,750	1,849	19	10	15	2,850	17	10	20	3,400	1	50	20	1,150	7,400
1,850	1,949	20	10	15	3,000	18	10	20	3,600	1	50	20	1,150	7,750
1,950	2,049	21	10	15	3,150	19	10	20	3,800	1	50	20	1,150	8,100
2,050	2,149	22	10	15	3,300	20	10	20	4,000	1	50	20	1,150	8,450
2,150	2,249	23	10	15	3,450	21	10	20	4,200	1	50	20	1,150	8,800
2,250	2,349	24	10	15	3,600	22	10	20	4,400	1	50	20	1,150	9,150
2,350	2,449	25	10	15	3,750	23	10	20	4,600	1	50	20	1,150	9,500
2,450	2,549	26	10	15	3,900	24	10	20	4,800	1	50	20	1,150	9,850
2,550	2,649	27	10	15	4,050	25	10	20	5,000	1	50	20	1,150	10,200
2,650	2,749	28	10	15	4,200	26	10	20	5,200	1	50	20	1,150	10,550
2,750	2,849	29	10	15	4,350	27	10	20	5,400	1	50	20	1,150	10,900
2,850	2,949	30	10	15	4,500	28	10	20	5,600	1	50	20	1,150	11,250
2,950	3,049	31	10	15	4,650	29	10	20	5,800	1	50	20	1,150	11,600

61010-7.1.1. Admin GSF/PN. The sum of all space types identified above (private offices, workstations, admin support space, break rooms, conference/training rooms and secondary circulation space) multiplied by the NTG factor, make-up the Admin GSF/PN factor. This factor shall not exceed 162.5 GSF/PN.

61010-7.2. **Special Purpose Space - Functional Support Group.** These space types are additive to the 162.5 GSF/PN threshold and must be individually justified. The Admin BFR Generator accounts for these space types by calculating a “Total GSF/PN factor”. The Total GSF/PN factor may exceed 162.5 GSF/PN where justified.

Table 61010-7.2. **Functional Support Group Space Types**

<b>Space Type:</b>	<b>Description:</b>	<b>Planning Factor:</b>	<b>Justification Guidelines:</b>
<p>Archive Storage Room</p>	<p>An archive storage room provides space for long-term (5+ years) storage of hardcopy files. Storage space may include letter file cabinets, legal file cabinets, flat file cabinets, high density filing systems, etc.</p> <p>Note 1: Archive storage is different from central file storage included within the administrative support space allocations for group working files.</p> <p>Note 2: Archive storage is different from distributed file storage included within a private office or workstation space allocation for individual working files.</p> <p>No planning factors exist for this space type. A space analysis is required.</p>	<p>Allocate NSF requirement based on specific archive storage needs</p>	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Records retention requirements per SECNAV M-5210.1 apply</li> <li>• Records types (legal, personnel, real estate, other)</li> <li>• Other justification</li> </ul>
<p>Command Suite, Private Office</p>	<p>A command suite is an office area configuration containing private offices for the command leadership and key staff. Since private offices have already been accounted for in the space loading, this is an additional 80 NSF allocation for Installation Commanding Officers at the O6 level or above, and all flag and/or SES level personnel serving in a supervisory capacity.</p>	<p>Allocate an additional 50 NSF for each SES/O7 or ICO O6.</p>	<ul style="list-style-type: none"> <li>• Number of SES (Senior Executive Service) personnel identified in loading reports</li> <li>• Number of O7 or higher (Rear Admiral, Brigadier General or higher) personnel identified in loading reports</li> <li>• ICO O6 or higher (Installation Commanding Officer – Navy Captain, Full Colonel or higher) identified in loading reports</li> </ul>

Table 61010-7.2. **Functional Support Group Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
<p>Hazardous Material Storage Room</p>	<p>A hazardous material storage room provides storage for flammable, reactive, corrosive or toxic materials. This space type is a dedicated room and does not apply to individual free standing or wall-mounted cabinets within other room types. No planning factors exist for this type of space. A space analysis is required.</p>	<p>Allocate NSF requirement based on specific hazardous material storage needs</p>	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Type of hazardous material storage (corrosive, flammable, reactive or toxic)</li> <li>• Supported by space analysis</li> <li>• Other justification</li> </ul>
<p>Interview Room</p>	<p>Interview rooms are used to conduct interviews in a private and professional environment, free of distractions. Plan for up to two interview rooms, located adjacent to an observation room.</p>	<p>Allocate up to two interview rooms at 120 NSF each</p>	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Applicable to certain Echelon II IG functions</li> <li>• Applicable to certain NCIS functions</li> <li>• Address feasibility of using CCTV feeds instead of providing an observation room</li> <li>• Other justification (human resource functions, polygraph functions, speech therapy functions, etc.)</li> </ul>
<p>Lg Format Production Room</p>	<p>A large format production room provides space for high-quality, large scale copier, printer, plotter and/or scanner equipment. It should include space for material storage such as large format paper rolls and ink cartridges. This space type typically applies to technical or operational functions. It is not intended for traditional office equipment, which is already accounted for in the admin support space allocation. No planning factors exist for this type of space. A space analysis is required.</p>	<p>Allocate NSF requirement based on specific large format production equipment</p>	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Function(s) supported (e.g., architecture, engineering, operational)</li> <li>• Equipment type(s) to be housed (e.g., large scale copiers, printers, plotters, scanners, other)</li> <li>• Other justification</li> </ul>

Table 61010-7.2. **Functional Support Group Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Locker Room	<p>A locker room provides temporary storage space for a change in clothing and other personal belongings.</p> <ul style="list-style-type: none"> <li>• Lockers authorized in support of personnel performing 24-7 operations. Provide one locker per person based on the largest shift.</li> <li>• Lockers authorized in support of physical training requirements for military personnel at remote locations, without access to fitness centers. Provide one locker for every 10 military personnel assigned.</li> <li>• Lockers authorized in support of security personnel. Provide one locker per person based on the largest shift.</li> </ul> <p>Use the guidance above to determine the number of lockers required.</p>	Allocate lockers at 8 NSF each	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Access to a fitness center is greater than a 15-minute drive time</li> <li>• Military, civilian and/or contractor personnel may require lockers in support of 24-7 shift or emergency operations</li> <li>• Military personnel may require lockers in support of mandatory physical training requirements</li> <li>• The number of military personnel contributing to this space requirement is supported by an official personnel loading report</li> <li>• Other justification</li> </ul>
Mailroom	<p>A mailroom accommodates processing and distribution of a facility's incoming and outgoing mail and parcels. A mailroom must be individually justified for operational, site specific or other reasons such as large size of organization. Office space for mailroom personnel is already accounted for within the office space loading above.</p>	Allocate 40 NSF for every 50 personnel assigned	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Organization has 200 or more personnel</li> <li>• Access to the central postal facility is greater than a 15-minute drive time.</li> <li>• Security requirements warrant a standalone mailroom</li> <li>• Hours of operation</li> <li>• Other justification</li> </ul>

Table 61010-7.2. **Functional Support Group Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Observation Room	An observation room is for monitoring interviews. Located adjacent to one or two interview rooms, it provides sufficient space for a small table, two chairs, and audiovisual recording equipment. One-way glass windows share common walls with the interview room(s). If feasible, consider using CCTV feeds rather than providing space for an observation room.	Allocate one observation room at 100 NSF	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Applicable to certain Echelon II IG functions</li> <li>• Applicable to certain NCIS functions</li> <li>• Address feasibility of using CCTV feeds instead of providing an observation room</li> <li>• Other justification (human resource functions, polygraph functions, speech therapy functions, etc.)</li> </ul>
Secure Storage Room	A Secure Storage Room provides a separate lockable room for storage of sensitive or high-value equipment.	Allocate one secure storage room at 100 NSF	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Applicable to certain NCIS functions</li> <li>• Other justification</li> </ul>
Shipping / Receiving Area	A shipping/receiving area accommodates loading and unloading of a wide variety of supplies and services necessary for operations. Most items can be stored in racks and stacked up to eight feet in height, while heavy items such as bulk paper supplies must remain on pallets. A shipping/receiving area must be individually justified for operational, site specific or other reasons such as large size of organization.	Allocate 80 NSF for every 50 personnel assigned	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Organization has 200 or more personnel</li> <li>• Access to a central shipping/receiving facility is greater than a 15-minute drive time</li> <li>• Security requirements warrant a standalone shipping/receiving area</li> <li>• Hours of operation</li> <li>• Other justification</li> </ul>



Table 61010-7.2. **Functional Support Group Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
<p>Shower Room</p>	<p>A shower room provides one or more shower stalls and is typically collocated with a bathroom and/or locker room.</p> <ul style="list-style-type: none"> <li>• Showers authorized in support of personnel performing 24-7 operations, without access to fitness centers. Provide one shower for every 10 persons of largest shift.</li> <li>• Showers authorized in support of military personnel physical training requirements, without access to fitness centers. Provide one shower for every 20 military personnel assigned.</li> </ul> <p>In both cases, a ratio of 80 / 20, male / female (ratio may go up as staffing structure dictates but not lower than 80 / 20), should be used for planning purposes. Use the guidance above to determine the number of showers required.</p>	<p>Allocate showers at 20 NSF each</p>	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Access to a fitness center by walking is 5 minutes or greater or a 15-minute drive time.</li> <li>• Military, civilian and/or contractor personnel may require showers in support of 24-7 shift or emergency operations</li> <li>• Military personnel may require showers in support of mandatory physical fitness requirements</li> <li>• The number of military personnel contributing to this space requirement is supported by an official personnel loading report.</li> <li>• Other justification is acceptable, particularly as it applies to mission integrity and readiness.</li> </ul>
<p>Technical Equipment Area</p>	<p>A technical equipment area is used for check-in /check-out and charging of government issued equipment (cell phones, ELMRS radios, laptops, etc.)</p>	<p>Allocate one technical equipment area at 100 NSF</p>	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Applies to CCN 89051</li> <li>• Other justification</li> </ul>

Table 61010-7.2. **Functional Support Group Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
<p>Technical Publications Library</p>	<p>A technical publications library provides ready access to technical manuals, handbooks, and other guidance. Note that the need for this space type has diminished, as many resources are now readily available online. As a space saving measure, consider combining technical libraries within other spaces such as small conference/training rooms, rather than providing a separate allocation. No planning factors exist for this type of space. A space analysis is required.</p>	<p>Allocate NSF space requirement based on specific technical publications library needs of organization</p>	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Function(s) supported (e.g., architecture, engineering, legal, other)</li> <li>• Number and size of technical libraries required.</li> <li>• Other justification</li> </ul>
<p>Vault Room</p>	<p>A vault room is a secured area for handling classified material. It typically includes a worktable area and access to one or more shared SIPRNet workstations. Assume 48 NSF per workstation plus an additional 16 NSF per workstation to account for a central worktable area. The basic allocation factor becomes 64 NSF per workstation. The number of workstations required is provided/verified by the special security officer (SSO) or security manager.</p>	<p>Allocate 64 NSF per workstation</p>	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Number of workstations required.</li> <li>• Number and size of vaults required if more than one.</li> <li>• Other justification</li> </ul>
<p>Other Functional Support Space</p>	<p>This is a user-defined, functional support space type and allocation. It is intended for "one-off" space types not included above.</p>	<p>Allocate NSF for this user-defined space type</p>	<p>Provide justification for this user defined space requirement</p>

61010-7.3. **Special Purpose Space - Security Group.** These space types must be individually justified in support of specific missions or functions.

Table 61010-7.3. **Security Group Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Entry Control Area	An entry control area may be authorized for secure facilities allowing for orderly check-in and checkout. The entry control area provides for one entry and one exit channel adjacent to one or more security watch stations. This area includes an additional 20 NSF for every 50 personnel assigned to the organization to accommodate transit of building personnel through the entry control area. Security watch station(s) are a separate allocation (see below).	Allocate one entry control area at 100 NSF plus 20 NSF for every 50 personnel assigned	<ul style="list-style-type: none"> <li>• Mission or functions performed.</li> <li>• Applicable to certain operational functions. See 131 series justification guidelines.</li> <li>• Other justification</li> </ul>
Secure Visitor Waiting Area	A secure visitor waiting area may be authorized for secure facilities. This space type may also apply to NCIS functions and certain Echelon II Inspector General functions. In this capacity, it separates individuals under investigation or awaiting interview from other visitors and ongoing investigations. This separate waiting area helps to maintain security, protect the integrity of investigations, and avoid compromising the facts and circumstances surrounding a criminal inquiry.	Allocate one secure visitor waiting area at 120 NSF	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Applicable to certain operational functions. See 131 series justification guidelines.</li> <li>• Applicable to certain Echelon II IG functions and NCIS functions</li> <li>• Other justification</li> </ul>
Security Watch Station	A security watch station provides space to house a security officer and security system monitoring equipment. A security watch station is typically located adjacent to a lobby or quarterdeck area to control building ingress and egress.	Allocate NSF based on specific security office requirements	<ul style="list-style-type: none"> <li>• Mission - Organization's mission requires security beyond that provided by the host installation</li> <li>• Size - Organization's size requires security beyond that provided by the host installation</li> <li>• Location - Organization's location is geographically separated from the host installation</li> <li>• Other justification</li> </ul>

Table 61010-7.3. **Security Group Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Special Security Officer Suite	A special security officer (SSO) suite is a multifunctional area containing, but not limited to, a reception area, indoctrination area, photography area, vault space, and office space for the SSO. An SSO suite may be required depending on the TS/SCI classification level and where SCIF or SAP facilities are present.	Allocate NSF based on 131 series space planning factors	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• See 131 series justification guidelines</li> <li>• Other justification</li> </ul>
Weapons Vestibule and Vault	A weapons vestibule and vault are for the secure storage of weapons. The vestibule and vault are actually two separate rooms. The vestibule is equipped with individual lockers for each issued weapon, a cleaning counter with proper ventilation, and a safety loading/unloading barrel. Include a hazardous materials storage cabinet for solvent and cleaning materials. The vault is equipped with racks.	Allocate one weapons vestibule and vault at 120 NSF	<ul style="list-style-type: none"> <li>• Mission or functions performed</li> <li>• Applicable to certain operational functions</li> <li>• Applicable to certain NCIS functions</li> <li>• Applicable to certain security functions</li> <li>• Other justification</li> </ul>
Other Security Space	This is a user-defined, security space type and allocation. It is intended for "one-off" space types not included above.	Allocate NSF for this user-defined space type	<ul style="list-style-type: none"> <li>• Provide justification for this user defined space requirement</li> </ul>

61010-7.4. **Net Special Purpose Space Subtotal.** Sum of all special purpose space types.

61010-7.5. **Special Purpose Space Secondary Circulation.**

Circulation	All special purpose spaces are assumed to be enclosed. A circulation multiplier of 0.12 is multiplied by the net special purpose space subtotal.	Allocate NSF based on: (0.12) (net special purpose space subtotal)	<ul style="list-style-type: none"> <li>• Space type does not require justification</li> </ul>
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61010-7.6. **Net Special Purpose Space.** Sum of all special purpose space types, *including* secondary circulation.

61010-8. **Net Building Area.** Net Building Area is the sum of net general administrative space and net special purpose space.

61010-9. **Net-to-Gross Space.** Net-To-Gross (NTG) space types are used to calculate an overall NTG area and NTG factor on a case-by-case basis.

Table 61010-9. **Net-To-Gross Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Adjust Building Height (option)	<p>By default, the “Adjust Building Height” option is not applied (not checked), allowing the Admin BFR Generator to optimize the number of above ground floors (stories).</p> <p>If preparing BFR for an entire organization, use the default option.</p> <p>If preparing project level BFR and the number of stories is known, apply this option and adjust the number of floors accordingly.</p> <p>If preparing BFR for an individual component of an organization with less than 100 personnel, apply this option and adjust the number of floors to one.</p>	Number of above ground floors is variable	<ul style="list-style-type: none"> <li>• This option does not require justification</li> </ul> <p>Note: Once the number of above ground floors is established, a “net average floor area” is calculated for use in follow-on calculations.</p>
Bathrooms	<p>The number of toilet fixtures is based on UFC 3-420-01, Plumbing Systems. Bathrooms are assumed to be located on each floor. For planning purposes, bathrooms allocations are based on standardized modules and the number of persons per floor.</p>	Allocate NSF based on: See Bathroom Allocations table	<ul style="list-style-type: none"> <li>• Space type does not require justification</li> </ul>

Table 61010-9. **Net-To-Gross Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Electrical Space	An electrical room houses electrical equipment for power distribution to other areas of a building. Multi-story buildings will have at least one electrical room per floor. The total allocation is equivalent to 60% of central mechanical room allocation.	Allocate NSF based on: $x = (y/69.2)^{1.053}$ (0.6), where x = electrical space, y= net bldg.. area	<ul style="list-style-type: none"> <li>• Space type does not require justification</li> </ul>
Elevator Hoistway	<p>An elevator used for the movement of personnel must be designed as a passenger elevator. Passenger elevators may be used for general freight loading by using a heavy-duty interior to resist damage from hand trucks.</p> <p>For planning purposes, assume elevator must be able to accommodate an ambulance type stretcher (84" X 24") and a 4,000-pound load capacity.</p>	<p>For 2 to 4 stories, allocate one hydraulic elevator per 10,000 NSF of avg. floor area at 82 NSF each x no. of floors</p> <p>For 5 to 10 stories, allocate one traction elevator per 10,000 NSF of avg. floor area at 91 NSF each x no. of floors</p>	<ul style="list-style-type: none"> <li>• Space type does not require justification</li> </ul>

Table 61010-9. **Net-To-Gross Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Elevator Machine Room	An elevator machine room contains the elevator machine equipment and controller. One elevator machine room is allocated for each elevator.	<p>For 2 to 4 story buildings, allocate one machine room per elevator per 10,000 NSF of ground floor area at 72 NSF each.</p> <p>For 5 to 10 story buildings, allocate one machine room per elevator per 10,000 NSF of ground floor area at 152 NSF each.</p>	<ul style="list-style-type: none"> <li>• Space type does not require justification</li> </ul> <p>Note: Net ground floor area is equal to net average floor area.</p>
Janitor's Closet	A janitor's closet accommodates all equipment and supplies to include a 24-inch square mop basin, a wall-mounted mop rack, and three feet of 10-inch wide wall shelving.	Allocate NSF based on: (one per 10,000 NSF of avg. floor area) (20 NSF/each) (# floors)	<ul style="list-style-type: none"> <li>• Space type does not require justification</li> </ul>

Table 61010-9. Net-To-Gross Space Types

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Mechanical Space	<p>For planning purposes, assume a variable air volume system is used with a central (primary) mechanical room located on the ground floor and one or more distributed (secondary) fan rooms located on each floor.</p> <p>The following equation estimates the central mechanical room area for an office building:  <ul style="list-style-type: none"> <li>• <math>x=(y/69.2)^{1.053}</math>, where x = size of mechanical room (NSF) and y = net building area (NSF)</li> </ul> </p> <p>The following equation estimates the area for all fan rooms:  <ul style="list-style-type: none"> <li>• <math>x=(y/58)^{1.087}</math>, where x = size of fan rooms (NSF) and y = net building area (NSF).</li> </ul> </p>	<p>Allocate NSF based on:  <math>x = (y/69.2)^{1.053} + (y/58)^{1.087}</math>                      where x = sum of mechanical spaces and y = net building area</p>	<ul style="list-style-type: none"> <li>• Space type does not require justification</li> </ul>
Primary Circulation Multiplier	<p>Primary circulation consists of the main circulation routes (hallways) connecting to the building core and common spaces (elevators, stairwells). This multiplier accounts for lobby / quarterdeck areas, but not the entry control area, security watch stations or secure visitor waiting areas listed above. Primary circulation is associated with net-to-gross space, unlike secondary circulation space, which is associated with the “net building area”.</p>	<p>Allocate NSF based on: (primary circulation multiplier) (net building area - secondary circulation areas)</p>	<ul style="list-style-type: none"> <li>• Space type does not require justification</li> </ul>
Stairwell	<p>A vertical penetration in a multi-floor building for personnel egress. For planning purposes, one story is assumed to be 12 feet in height.</p>	<p>Allocate NSF based on: (one per 10,000 NSF of avg. floor area) (200 NSF/each) (# floors)</p>	<ul style="list-style-type: none"> <li>• Space type does not require justification</li> </ul>



Table 61010-9. **Net-To-Gross Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Telecom Room	Telecommunication rooms enable telephone and computer connectivity throughout a building, providing space for telephone switches and rack-mounted computer equipment.	Allocate NSF based on: (one per 10,000 NSF of avg. floor area) (110 NSF/each) (# floors)	<ul style="list-style-type: none"> <li>• Space type does not require justification</li> </ul>
Vestibule	A building entrance vestibule serves a dual purpose. First, it helps mitigate temperature differences between the indoor and outdoor environment and secondly, provides an area where people entering the building can wipe their feet on an appropriate surface.	Allocate NSF based on: (one per 10,000 NSF of ground floor area) (60 NSF/each)	<ul style="list-style-type: none"> <li>• Space type does not require justification</li> </ul> <p>Note: Net ground floor area is equal to net average floor area.</p>
Other NTG Space1	This is a user-defined NTG space type and allocation. It is intended for “one-off” space types not included above.	Allocate NSF requirement for this user-defined space type.	<ul style="list-style-type: none"> <li>• Provide justification for this user defined space type</li> </ul>
Other NTG Space2	This is a second user-defined NTG space type and allocation. It is intended for “one-off” space types not included above.	Allocate NSF requirement for this user-defined space type.	<ul style="list-style-type: none"> <li>• Provide justification for this user defined space type</li> </ul>
Adjust Building Width (option)	By default, this option is not applied (not checked) and the Admin BFR Generator assumes a square footprint. Using the checkbox option allows the user to adjust the width of the building. The building width slider ranges from 30 feet wide to 210 feet wide. Building width affects the building perimeter and is used to calculate the area associated with exterior walls.	Building width and length are variable	<ul style="list-style-type: none"> <li>• This option does not require justification but should only be applied if site specific project requirements are known.</li> <li>• Note: Daylighting and natural ventilation cooling can be important energy-saving strategies, and both require one dimension of the building to be relatively narrow, in the order of 45 to 60 ft.</li> </ul>

Table 61010-9. **Net-To-Gross Space Types**

Space Type:	Description:	Planning Factor:	Justification Guidelines:
Exterior Wall Thickness Area	Accounts for the square footage associated with exterior walls. Exterior wall thickness is assumed to be 16 inches (1.33 feet) thick. By default, the Admin BFR Generator applies this space type.	Allocate NSF based on: (average net floor area perimeter) (wall thickness) (# floors)	<ul style="list-style-type: none"> <li>Space type does not require justification</li> </ul>

61010-9.1. **NTG Space Total.** The NTG Space Total is the sum of all NTG space types above.

61010-9.2. **NTG Factor.**

NTG Factor	Once the net building area and net-to-gross space total have been established, the Net-To-Gross (NTG) factor can be calculated.	NTG factor = (net bldg area + NTG space total) / (net bldg area)	Justification Guidelines: <ul style="list-style-type: none"> <li>Not applicable</li> </ul>
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61010-9.3. **NTG Factor Override.**

NTG Factor Override	The NTG Factor Override function is provided within the Admin BFR Generator for situations in which an alternative NTG gross factor is required. By default, this function is not applied (not checked).	NTG factor is variable	Justification Guidelines: <ul style="list-style-type: none"> <li>Admin space within another category code that has a higher or lower NTG factor</li> <li>Admin buildings must conform to host nation construction standards, which may dictate a higher NTG factor</li> <li>Other justification</li> </ul>
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61010-10 **Gross Building Area.** Gross Building Area accounts for a building's above-ground stories measured to the outside wall surfaces. Gross Building Area is calculated by multiplying the Net Building Area by the Net-To-Gross Factor (or NTG Factor Override). Gross Building Area represents the overall Basic Facility Requirement (BFR).

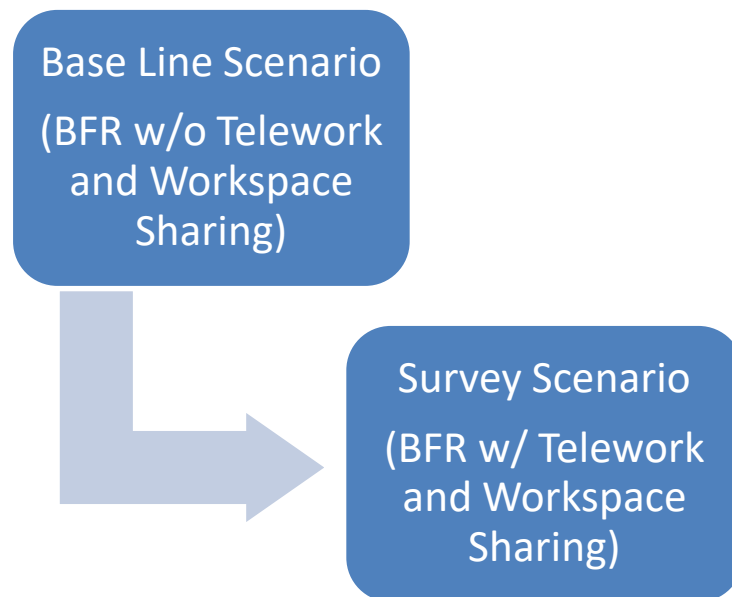
## 61010 -11 Telework and Workspace Sharing

### 61010-11.1 Introduction

Using building blocks of the existing criteria for Administrative Office and the Admin BFR Generator, this section defines the process for developing a reduced Basic Facility Requirement (BFR) that accounts for a robust telework and workspace sharing program. Individual organizations are responsible for updating telework and workspace sharing policies to meet their specific needs. The process defined here allows flexibility for consultants tasked with layout and implementation.<sup>1</sup>

Various federal agencies have successfully implemented reduced space requirements through the use of telework and workspace sharing. At the time of this writing, February 2021, the long-term impacts of robust and sustained telework usage for DoD organizations are unclear. Numerous DoD organizations are concurrently developing space reduction and implementation plans. It is anticipated that there will be some lessons learned from these concurrent efforts, therefore, this update provides initial guidance that will likely undergo incremental updates as part of an iterative process.

### 61010-11.2 Process



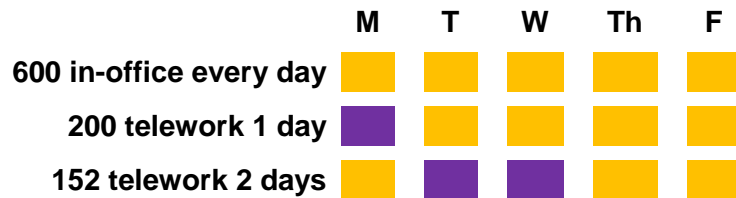
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<sup>1</sup> Additional savings may be realized by accounting for employee work patterns and are best realized by consultant tasked with layout and implementation. These smaller space savings are not accounted for within this guidance.

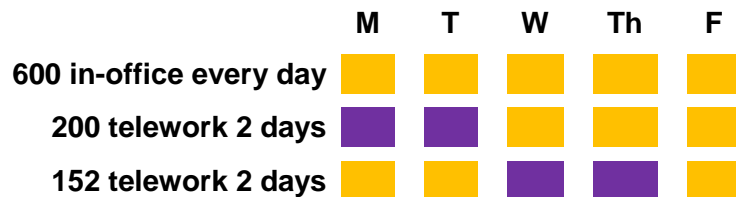
**61010-11.3 TW6+ Rationale**

Savings on office space and related costs may be achieved if enough employees telework often enough. The graphic below provides three scenarios; each for an organization with 600 employees where 248 (41%) do not telework and 352 (59%) do.

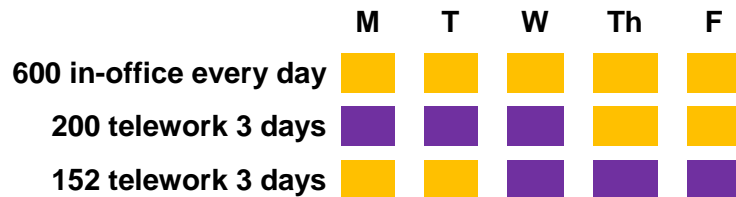
In the first scenario, 200 employees telework 1 day a week and 152 telework 2 days a week. No matter how you arrange schedules, there will always be at least 2 days a week when you need space for all 600 employees.



In the second scenario, where all teleworkers work 2 days a week from home, there is still one day a week when you need space for everyone.



The third scenario identifies a minimum of 352 workspace sharing opportunities every day. Assuming schedules are arranged accordingly, a 2:1



(2 persons:1 seat) sharing ratio results in a reduction of 176 workspaces. This diagram points out the obvious fact that the more teleworkers you have working three or more days a week from home, the greater the chance of freeing up office space.

So, while an organization may start small, there is real incentive to ramp up so that a significant amount of work is home-based. This emphasizes the need for good telework managers and technology that allows workers to do any work at home that they could do in the office.

As a rule of thumb, the threshold for freeing up space is when employees are allowed to telework three or more days a week, or as with the case of the federal government, when employees are allowed to telework six or more days a pay period (TW6+).

The scenarios presented above are generalized to make a point, but do not consider specifics such as the type of space being shared, whether it be private office or workstation space. Guidance provided in remainder of this section does consider the specific space types and applies sizing standards.

## 61010-11.4 Space Sizing Standards<sup>2</sup>

Private Office



A private office provides an enclosed space and is typically occupied by supervisory personnel or for those personnel whose job duties require privacy. Depending on an organization's telework and workspace sharing policies, this space type may be dedicated or shared. Private office space allocations typically range from 100-120 NSF/PN.

WST1



A WST1 (WS Type 1) is a modular workstation, typically occupied by general administrative or support staff. Depending on an organization's telework and workspace sharing policies, this space type may be dedicated or shared. WST1 space allocations typically range from 48-64 NSF/PN.

WST2



A WST2 (WS Type 2) is an optional space type, similar to WST1 modular workstation, but provides an alternate (usually smaller) size. It may serve as contractor space, hoteling space, or swing space during renovation projects. Depending on an organization's telework and workspace sharing policies, this space type may be dedicated or shared. WST2 space allocations typically range from 36-48 NSF/PN.

<sup>2</sup> The Admin BFR Generator accounts for three standard space sizes (Office, WST1, and WST2 space). "Workspace Size Overrides" may be applied in the Activity tab if default values are not applicable.

### **61010-11.5 Sharing Ratios**

Sharing ratios may be applied from 1:1 (no sharing) to 5:1 (maximum sharing). Sharing ratios indicate the number of persons per seat, for example, 2:1 indicates “2 persons:1 seat”. If shared WST1 spaces have a 3:1 or greater sharing ratio, they are automatically converted to WST2 space. Sharing ratios reduce the overall number of personnel in-office, but contribute to greater collaboration space allocations at the same time.

### **61010-11.6 Special Purpose Space**

Special purpose space can impact an organizations ability to reduce space. Those that are not based on the number of personnel will invariably increase the GSF/PN factor, even as the “in-office” number of personnel decreases from workspace sharing. For instance, an Echelon II Headquarters Command will require some form of Operations Center. While specific space requirements for an operations center would be based on ‘CCN 14365 – Regional/Installation Operations Center’ criteria, the NSF results can be captured in the Admin BFR Generator via a “user defined field”.

### **61010-11.7 Collaboration Space**

Collaboration space is another type of special purpose space, but only applies if workspace sharing is utilized. Collaboration spaces are typically enclosed and provide users with a variety of the modern technology capabilities. Collaboration space is allocated at 16 NSF/PN for each person reduced from the Base Line personnel total. This value is calculated automatically in the Admin BFR Generator. Note that collaboration space allocations are in addition to basic allowances for admin support space, break rooms and conference rooms.

**61010-11.8 Sample Scenario**

An organization has 614 personnel

- 111 PN occupy private office space
- 503 PN occupy WST1 space
- 0 PN occupy WST2 space

Based on a workplace survey, it is determined that:

- 65 PN require a dedicated private office space and 46 PN require shared private office space
- 143 PN require a dedicated WST1 space and 360 PN require shared WST1 space
- WST2 space is not applicable in this scenario

Sharing Ratios

- Workspace sharing ratio for private office space is 4:1
- Workspace sharing ratio for WST1 spaces is 5:1
- WST2 space is not applicable in this scenario

**61010-11.9 Establishing a Base Line Scenario<sup>3</sup>**

Space Loading	Private:	WS Type 1:	WS Type 2:	Space Loading:
Base Line	111	503	0	614 PN
Average Office Size Defaults:	120 NSF/PN	64 NSF/PN	0 NSF/PN	
Apply Office Size Overrides: <input type="checkbox"/>	120	64	48	

Base Line Scenario	Private	WST1	WST2	Space Loading
Total Persons	111	503	0	614

<sup>3</sup> Base Line Scenario space loading is entered in “Activity” tab of Admin BFR Generator. Workspace sizes may be adjusted in “Activity” tab.

### 61010-11.10 Establishing a Survey Scenario<sup>4</sup>

Establish a 'Survey' Scenario based on survey results that accounts for telework and workspace sharing. Note that a Base Line Scenario must be established prior to establishing a Survey Scenario. For space planning purposes, personnel will fall into one of two categories:

1. Employees that telework 0-5 days a pay period require a **dedicated** workspace
2. Employees that telework 6-10 days a pay period (TW6+) require a **shared** workspace

A Telework/Workspace Sharing Survey must be able to answer the following questions:

1. How many persons require a dedicated private office?
2. How many persons require a dedicated WST1 (WS Type 1) space?
3. How many persons require a dedicated WST2 (WS Type 2) space?
4. How many persons require a private office but are eligible and willing to share space in exchange for flexibility to telework six or more days a pay period?
5. How many persons require a WST1 space but are eligible and willing to share space in exchange for flexibility to telework six or more days a pay period?
6. How many persons require a WST2 space but are eligible and willing to share space in exchange for flexibility to telework six or more days a pay period?

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<sup>4</sup> Base Line Scenario must be established prior to establishing Survey Scenario



Sample Survey Results:

Survey		Office Based			Telework Based		
Business / Support Line	Employees	Dedicated Private Office	Dedicated WS Type 1 Space	Dedicated WS Type 2 Space	Shared Private Office	Shared WS Type 1 Space	Shared WS Type 2 Space
AM	73	2	11	0	10	50	0
BD	88	10	32	0	1	45	0
CIO	66	2	4	0	7	53	0
ACQ	10	1	0	0	3	6	0
Counsel	10	6	0	0	3	1	0
DC	60	12	22	0	4	22	0
EV	35	5	10	0	1	19	0
EXBL	40	3	2	0	6	29	0
EXPO	49	3	15	0	0	31	0
CIOFP (EXWC)	34	2	5	0	1	26	0
FM	40	5	21	0	0	14	0
Front Office	13	6	6	0	1	0	0
IG	5	2	0	0	0	3	0
OPS	16	2	5	0	0	9	0
PW	60	2	2	0	9	47	0
Safety	6	1	5	0	0	0	0
SIOP	7	0	3	0	0	4	0
Small Business	2	1	0	0	0	1	0
<b>Validated Totals:</b>	<b>614</b>	<b>65</b>	<b>143</b>	<b>0</b>	<b>46</b>	<b>360</b>	<b>0</b>

Summarize sample survey results as shown below<sup>5</sup>

Survey Scenario	Private:	WS Type 1:	WS Type 2:	Space Loading:	Survey TW6+
Dedicated	65	143	0	208 PN	66.12%
Shared	46	360	0	406 PN	
Total	111 PN	503 PN	0 PN	614 PN	

Survey Scenario	Private	WST1	WST2	Space Loading
Dedicated	65	143	0	208
TW6+ Shared	<u>46</u>	<u>360</u>	<u>0</u>	<u>406</u>
Total Persons	111	503	0	614

**Important!** Survey Scenario totals must equal Base Line Scenario totals.

Base Line Scenario	Private	WST1	WST2	Space Loading
Total Persons	111	503	0	614

All necessary information is now available to establish a Survey Scenario using Admin BFR Generator and following the process below

1. Select Telework tab
2. Select 'Base Line' from picklist
3. Set 'GSF w/o Telework' equal to 'Gross Bldg Area' for Base Line
4. Select 'Survey' from picklist
5. Enter 'Survey' results
6. Apply 'Sharing Ratios'

<sup>5</sup> Survey Scenario space loading is entered in "Telework" tab of Admin BFR Generator

### Sample Survey Scenario Output

Activity	Space_Table	Justification	Net_To_Gross	Summary	Telework
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**Telework**

Activity Data:	
Installation:	N68469 - NSA WASHINGTON
Planning Area:	MAIN SITE - WASHINGTON NAVY YARD
Activity:	N00025 - NAVFACSYS COM WASH DC
Category Code:	61010 - ADMINISTRATIVE OFFICE

- Process:
- 1 Select 'Base Line' from picklist below
  - 2 Set 'GSF w/o TW' equal to 'Gross Bldg Area'
  - 3 Select 'Survey' from picklist
  - 4 Enter TW/Workspace Sharing Survey results
  - 5 Enter 'Sharing Ratios' with stepper
  - 6 Set 'Survey BFR' equal to 'Gross Bldg Area'

Current Scenario Type\* Survey

**Running Totals:**

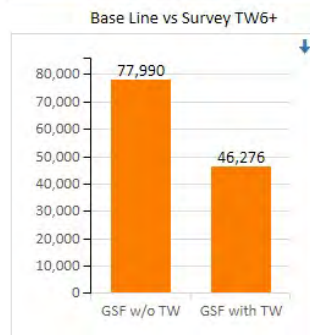
Private:	76 PN
WS Type 1:	143 PN
WS Type 2:	72 PN
Space Loading:	291 PN
Net Admin:	21,095 NSF
Net Special:	10,839 NSF
Net Bldg Area:	31,934 NSF
Admin NSF/PN:	92 NSF/PN
Est. Floors:	2 FL
Est. Width:	152 FT
Est. Length:	152 FT
NTG Area:	14,341 NSF
NTG Factor:	1.45 NTG
Gross Bldg Area:	46,276 GSF
Avg Floor Area:	23,138 GSF
Admin GSF/PN:	133 GSF/PN
Total GSF/PN:	159 GSF/PN

Base Line Scenario	Private:	WS Type 1:	WS Type 2:	Space Loading:	GSF w/o TW
Base Line Scenario	111 PN	503 PN	0 PN	614 PN	77,990

Survey Scenario	Private:	WS Type 1:	WS Type 2:	Space Loading:	Survey TW6+
Dedicated	65	143	0	208 PN	66.12%
Shared	46	360	0	406 PN	
<b>Total</b>	<b>111 PN</b>	<b>503 PN</b>	<b>0 PN</b>	<b>614 PN</b>	

Sharing Ratios*	Shared Pool	Sharing	Ratio	Shared
Private Office:	46 PN	- 4 +	4:1	11 PN
WS Type 1:	360 PN	- 5 +	5:1	0 PN
WS Type 2:	0 PN	- 1 +	1:1	72 PN

TW6+ Survey Scenario	Private:	WS Type 1:	WS Type 2:	Space Loading:	GSF with TW
Survey Scenario	76 PN	143 PN	72 PN	291 PN	46,276 GSF



Sharing Ratios

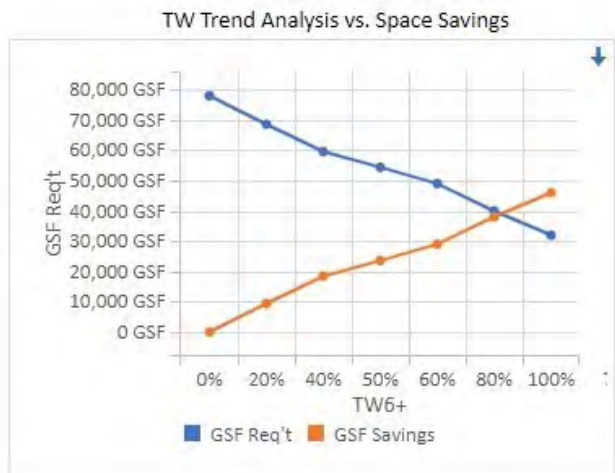
Private:	4:1
WS Type 1:	5:1
WS Type 2:	1:1
GSF w/o TW	77,990
GSF with TW	46,276
GSF Delta	31,714
Survey BFR	46,276 GSF

**61010-11.11 Establishing a Trend Analysis<sup>6</sup>**

The trend analysis is optional. Process steps are provided in the “Telework” tab after selecting “Trend” from picklist. This process prorates the Survey Scenario personnel loading between 0-100% and re-computes GSF space requirements at 20% intervals to generate a chart. This table and chart are useful for associating with a project timeline to show incremental space savings over time.

**Sample Trend Analysis Output**

TW6+	GSF Req't	GSF Savings	Savings (%)	Space Loading
0%	77,990	0	0%	614
20%	68,573	9,417	12%	517
40%	59,555	18,435	24%	419
50%	54,408	23,582	30%	370
60%	49,026	28,964	37%	322
80%	39,950	38,040	49%	224
100%	31,987	46,003	59%	159



Sharing Ratios	
Private:	4:1
WS Type 1:	5:1
WS Type 2:	1:1

<sup>6</sup> The ‘Trend’ Analysis is optional. It requires that the Base Line and Survey Scenarios are established.

## Conclusion

While significant space savings may be realized on paper, it is important to consider impacts of over-consolidation, future growth or surge requirements. Many Navy and Marine Corps administrative functions were able to adapt almost seamlessly from primarily working in an office environment to primarily working in a home environment as a result of the COVID-19 pandemic. A Center for Naval Analysis Study from December 2020 indicated that, “current productivity from remote working actually may be the result of previous **teamwork capital** created over time by in-person collaboration.”<sup>7</sup> Keep this in mind as you apply guidance contained here in Section 61010-11. It is better to err on the conservative side and let a layout and implementation consultant identify additional space savings.

## Helpful Tips

If using the Admin BFR Generator and results look suspect, check if:

1. Base Line space loading fields are entered in the Activity tab
2. "Office Size Overrides" are applied in the Activity tab
3. Special purpose space allocations are hidden by using checkbox to “Show all special space types” at top of Space Table tab
4. Correct "Scenario Type" is applied in the Telework tab.
5. Value manually entered for ‘GSF w/o TW’ is correct
6. Value manually entered for ‘GSF with TW’ is correct
7. If you leave scenario picklist set to “Trend” it no longer shows the “Survey” scenario output and associated reduced BFR value. The Trend analysis is an option that shows a scenario specific linear relationship between teleworking and workspace sharing. It is recommended to set “Current Scenario Type” to “Survey” before using “Submit” function

## **610 30 CLASSIFIED MATTER INCINERATOR/SHREDDER AND BLDG. (SF)**

**FAC 6100**  
**BFR Required Y**

61030-1 No planning factors are available. Provide facilities as required.

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<sup>7</sup> CNA Study, December 2020, Increased Teleworking: Potential Facility Savings and Policy Considerations

**610 40 LEGAL SERVICES FACILITY (SF)****FAC 6100****BFR Required Y**

61040-1 **DESCRIPTION.** Defense Service Offices (DSO), Regional Legal Service Offices (RLSO), Judiciary Offices, and Claims Centers provide comprehensive legal services to command and individual clients. These services include safe and secure trials by court-martial, administrative discharge proceedings and other personnel actions, adjudication of claims, legal assistance, and command advice. Properly designed and constructed, DSO/RLSO/Judiciary/Claims facilities emphasize the Navy's commitment to the administration of local, state, federal, and international law, improve the client's perception of the services provided by Navy legal personnel and allow for the most efficient provision of legal services.

61040-2 Generally, the space requirements for a DSO/RLSO/Judiciary Office/Claims Office relate to the following six functions:

1. Military Justice
2. Command Services
3. Claims
4. Legal Assistance
5. Unit Administration
6. Law Library

61040-3 Some of the space requirements can be derived from administrative space criteria, Category Code 610-10. DSOs/RLSOs/Judiciary Offices/Claims Offices, however, present a unique set of spatial constraints that must be recognized during the facility planning and design stages. These constraints include:

61040-3.1 The physical separation of the RLSO/trial counsel (prosecution, including appellate counsel), DSO/defense counsel (including appellate counsel), and judiciary (judge) spaces;

61040-3.2 Separate waiting areas for individuals waiting to be interviewed by trial and defense counsel and other clients not involved in military justice matters;

61040-3.3 Private offices for attorneys who must form attorney-client relationships that involve protected communications;

61040-3.4 Safe and secure courtrooms/courthouses where highly charged military justice proceedings routinely occur, the potential for violence is great, and the deterrence, detection and limitation of risk are paramount. Courtroom spaces must be designed to include metal detection equipment, private points of entry for various personnel, and other security measures addressed in COMNAVLEGSVCCOMINST 5530.2;

61040-3.3 Sufficient library space to allow for the continuous expansion of bound legal precedents and other legal materials.

61040-4 Table 61040-1 below delineates the functional elements of a DSO/ RLSO/Judiciary Office/Claims Office, provides planning factors, and comments on special requirements applicable to the individual elements. For the convenience of facility planners, Table 61040-1 has been designed to reflect the entire DSO/ RLSO/Judiciary Office/Claims Office operation. It may be used to calculate space requirements for the entire operation or for any of the individual components. DSO/RLSO/Judiciary Office/Claims Office facilities are planned and reported under Category Code 610 40.

**Table 61040-1. Space Allowance for Legal Services Facilities**

Type of Space	Allowances in NET SF (NSF)	Note
<b>1. Unit Administration</b>		
CO, XO, Senior Enlisted Advisor		1
Secretarial Staff	Use 610-10 Criteria	
Administrative Staff		2
Conference/Training Room	Small Activity-----1 ea 500 NSF Medium Activity----2 ea 500 NSF Large Activity-----1 ea 500 NSF + 1 ea 900 NSF	
Data Processing Space	Based upon equipment sizes	
<b>2. Legal Assistance</b>		
Legal Officers	120 NSF per counsel	1
Paralegals	110 NSF per person	
Staff	Use 610-10 Criteria	2
Waiting Room	9 NSF per occupant	3
Will Execution Room	100 NSF	8
<b>3. Claims</b>		
Legal Officers	120 NSF per counsel	1
Paralegals	64 NSF per person	
Staff	Use 610-10 Criteria	
Files	7 NSF per legal cabinet	
Archives	Small Activity-----150 NSF Medium Activity----200 NSF Large Activity-----400 NSF	
<b>4. Law Library</b>		
Stack Area	6.6 NSF per 100 volumes	
Work Area	25 NSF per person	
Staff	10% of stack plus reading areas	

Type of Space	Allowances in NET SF (NSF)	Note
Expansion	120 NSF	
<b>5. Military Justice</b>		
Courtrooms		
Trial by Court Members	1,500 NSF	4
Trial by Judge	900 NSF	4
<b>6. Support Spaces</b>		
Judges Chamber	250 NSF (one per judge)	
Deliberation Room	300 NSF	5
Witness Room	100 NSF (two per courtroom)	
Trial Counsel Spaces	150 NSF per Counsel	1, 6
Trial Counsel Waiting Area	9 NSF per Occupant	6
Defense Counsel Spaces	150 NSF per Counsel	1,6
Defense Counsel Waiting Area	9 NSF per Occupant	6
Detention Room	48 NSF (with W/C and Lavatory)	6
Court Reporter	150 NSF	1, 7
Paralegals	64 NSF	
Clerks	60 NSF	
ACDUTRA Counsel/IMC Spaces	64 NSF per Counsel	
Secure Storage	100 NSF	

**NOTES:**

1. Private offices required
2. Private offices for staff must be individually justified.
3. Locate waiting room to serve both legal assistance and claims sections
4. Provide one courtroom for each judge, if only one courtroom is required, plan for trial by court member. If two or more are required, plan for a 1 to 1 mix of courtroom types. Provide space for 40 to 50 spectators for trial by court member type courtroom and 20 to 25 spectators for trail by judge type.
5. Provide one deliberation room with separate and integral toilet facilities for each trail by court member courtroom.
6. Plan for a minimum of two defense and trail counsel offices with separate waiting rooms and detention room as part of defense counsel spaces. It is mandatory that defense and trail counsel spaces are separated to insure confidentiality of internal proceedings.
7. If space for more than one recorder or transcriber is required, plan for general office space with acoustically treated partitioning.
8. Provide for medium and large facility.

61040-5 To obtain gross floor area, add net areas and multiply by 1.50.



61040-6 As a general rule, legal service facilities will be categorized in one of three types: small facility (with approximately 30 personnel), medium facility (approximately 45 personnel), or large facility (approximately 135 personnel).

**MARINE CORPS FACILITIES**

61040-7 The Marine Corps has specific requirements for courtroom facilities at certain locations. This facility provides space for the courtroom and immediately adjacent space for trial proceedings. The basic allowance provides for the following: courtroom proper, prosecution counsel, prosecution witness, defense counsel, defense witness, court reporter, judge’s office, holding room, lobby, janitor, men’s toilet, women’s toilet and a single occupancy toilet.

61040-8 There are two facility types:

- **Type A** (large facility) - 4,440 gross sq. ft. (60' x 74'). The courtroom proper is 1,512 net sq. ft. (42' x 36') with provisions for trial by trial board members. In addition to the basic functional elements it includes a deliberation room.
- **Type B** (small facility) - 3,213 gross sq. ft. (51' x 63'). The courtroom proper is 825 net sq. ft. (30' x 27.5') with the basic functional elements as described above.

**Table 61040-2. Marine Corps Requirements**

Type of Function	Number of Type A Facilities	Number of Type B Facilities	Remarks
M.C.B.	1	1	Camp Pendleton requires two Type B facilities.
M.C.R.D.	1	1	
M.C.L.B.	1	1	
M.C.A.S.	1	0	New River requires a Type A facility. None at Tustin. 1 <sup>st</sup> Mar Brig is serviced by M.C.A.S. Kaneohe.
COMCABS EAST/WEST	1	1	3 <sup>rd</sup> Div. Requires 3 type A and 3 type B facilities
FMF (Div.)	1	2	
FMF (Wing)	1	1	
Force Troops	1	1	Force Service Support Group (F55G) is serviced by the Marine Corps air Ground Combat Center (MCAGCC).

**610 50      AUSTERE ADMINISTRATIVE FACILITY (SF)**

Facility planning criteria related to Austere Administrative Facilities can be found in FC 2-000-05N - Appendix F "Austere Facilities (Navy)."

**610 70      DIVISION/WING HEADQUARTERS, MARINE CORPS (SF)****FAC 6100****BFR Required Y**

61070-1      This category code is for a Fleet Marine Force (FMF) facility and provides the necessary administrative space to conduct the day-to-day operations of a Marine Division Headquarters or a Marine Aircraft Wing Headquarters. Determine requirements using the criteria for Category Code 610-10.

**610 71      REGIMENTAL/GROUP HEADQUARTERS, MARINE CORPS (SF)****FAC 6102****BFR Required Y**

61071-1      This category code is for a Fleet Marine Force (FMF) facility and provides the necessary administrative space to conduct the day-to-day operations of a Marine Regimental Headquarters or a Marine Aircraft Group Headquarters. Determine requirements using the criteria for Category Code 610-10.

**610 72      BATTALION/SQUADRON HEADQUARTERS, MARINE CORPS (SF)****FAC 6102****BFR Required Y**

61072-1      This category code is for a Fleet Marine Force (FMF) facility and provides the necessary administrative space to conduct the day-to-day operations of a Marine Battalion or a Squadron Headquarters. Squadron administrative facilities are often provided within the organizational maintenance hangar (Category Code 211 05) and in such cases, are not authorized under this category code. Determine requirements using the criteria for Category Code 610-10.

**610 73      COMPANY/BATTERY HEADQUARTERS, MARINE CORPS (SF)****FAC 6101****BFR Required Y**

61073-1 The category code is for a Fleet Marine Force (FMF) facility and is intended for those FMF units of company or battery size which require separate administrative facilities. Requirements for company or battery administrative functions are often included as part of other facilities such as bachelor enlisted quarters. Determine requirements using the criteria for Category Code 610-10.

**610 74 GARRISON AID STATION, MARINE CORPS (SF)**

**FAC 6102**

**BFR Required Y**

61074-1 DEFINITION. A Garrison Aid Station provides medical care at the local level for the Marine Corps and will generally be collocated with the Battalion and Regimental Headquarters facilities. The functions performed in this facility are both administrative and clinical in nature, which requires work space for the medical personnel assigned at the battalion, squadron, group, and regimental levels and space for medical file storage. Due to the functions performed at a Garrison Aid Station, it is vital to distinguish these areas from the rest of the Battalion/Squadron and Regimental/Group Headquarters facilities. This will allow for proper reporting and oversight of these facilities.

It should be noted that Garrison Aid Stations do not take the place of clinics maintained by BUMED, but rather provide the first echelon of basic medical care in a fixed facility. Access to higher echelons of care (including laboratory, radiological, or surgical services) shall be provided at BUMED facilities rather than the facility detailed here.

The Garrison Aid Station spaces may be divided up into four basic categories:

- Reception Area/Admin Area/Medical Records & Medical History Area
- Patient Areas
- Clinic Support
- Deployment Storage

61074-2 REQUIREMENTS COMPUTATION. Table 61074-1 provides space allowances or other planning guidance to calculate the facility requirements for the above components of a Garrison Aid Station.

**Table 61074-1. Space Allowances for Garrison Aid Stations**

Type of Space	Allowances	Notes
<b><i>Reception Area/Admin Area/Medical Records &amp; Medical History Area</i></b>		
Reception Desk	64 NSF per workspace	
Waiting & Form Writing	10 NSF per patient	
History Station	40 NSF per station	
Medical Officer (MO) Office	100 NSF per workspace	1
Independent Duty Corpsman Office (IDC)	65 NSF per workspace	

Type of Space	Allowances	Notes
Administrative Support Space:		
Office Equipment (Xerox, Fax, etc.)	45 NSF average	2
Computer Support	60 NSF average	2
Records Storage, Movable	25 NSF average	2
Records Workroom	<ul style="list-style-type: none"> <li>• 200 NSF for up to a battalion of 800 Marines</li> <li>• 25 NSF for up to an additional 100 Marines</li> </ul>	
Reference Bookshelves	8 NSF per bookshelf	
Restrooms	25 NSF per Exam Room	3
<b>Patient Areas</b>		
Exam Room	100 NSF per physician	4
Treatment Room	150 NSF	5
Nourishment Center	100 NSF	5
<b>Clinic Support</b>		
Clean Utility	120 NSF	
Soiled Utility	90 NSF	
Equipment Storage (blood pressure cuffs, carts, monitors, spare exam items, sterilizer, open boxes of supplies, etc.)	100 NSF average	2
Janitor closet	50 NSF	
Low Volume Pharmacy	50 NSF	6
<b>Deployment Storage</b>		
Deployment Storage	1,000 NSF	

**NOTES:**

1. The MO office should be a private office. The IDC workspaces should be shared semiprivate office spaces.
2. The NSF given is an average. If the actual equipment or amount of space required is known and approved for use within the General Administrative Space, then use the actual space requirements. Medical records must be stored in locked containers and the record room must be secured by lock. Computer access to the network is required; use network support spaces of 60 NSF when needed.
3. A minimum of two private restrooms (25 NSF each) to include toilet, sink, with an additional 25 NSF restroom space for each exam room above two. Sinks shall have hot and cold running water.
4. An exam room is built for privacy and consists of an exam table, exam table paper, wall mounted ophthalmoscope, exam light, supply cabinet, exam stool, exam room desk, and access to an additional sink with hot & cold running water. The additional sink is needed to provide the clinic staff with proper hand cleansing facilities following exposure to "dirty" procedures.

5. A treatment room is used for first aid performed by support staff. A Nourishment Center provides treatment for dehydration or blood-sugar treatment.
6. The low volume pharmacy includes both dispensing and storage functions. Controlled substances must be stored within a locked storage container and the pharmacy room must be secured by a lock.

61074-3      **GROSS FLOOR AREA.** To compute gross floor area, the net floor area should be multiplied by an adjustment factor to compensate for common circulation, Americans with Disabilities Act (ADA) requirements, mechanical equipment spaces, NMCI equipment racks, and wall thicknesses. Apply a Net-To-Gross adjustment factor of 1.35 to determine gross floor area. Floors shall be durable and easily cleaned to maintain sanitary conditions—do not use carpeting in patient areas.

**610 77      ADMIN STORAGE (READY ISSUE/SHOP STORES/MISC.) (SF)**

**FAC 6100**  
**BFR Required Y**

61077-1      Storage facilities for miscellaneous equipment or goods related to administrative facility support will be provided only where it can be individually justified. There are no criteria for this type of facility. General information on normal stacking heights, SF per measurement ton requirements, and other parameters are provided in Category Code 440 series.

**620            ADMINISTRATIVE FACILITIES – UNDERGROUND**

Criteria for the 620 series category codes are identical to Category Codes 61010 and 61077, respectively. Plan only where authorized by higher headquarters.

**620 10      UNDERGROUND ADMINISTRATIVE FACILITY (SF)**

**FAC 6200**  
**BFR Required Y**

**620 77      UNDERGROUND ADMIN STORAGE (READY ISSUE/SHOP STORES/MISC.) (SF)**

**FAC 6200**  
**BFR Required Y**

**690 OTHER ADMINISTRATIVE FACILITIES**

No planning factors are available for the 690 series. Provide facilities as required.

**690 10 FLAGPOLE / MARKER (EA)**

**FAC 6900**

**BFR Required N**

**690 15 SALUTING BATTERY GUN MOUNT (EA)**

**FAC 6900**

**BFR Required N**

**690 25 REVIEWING STAND (EA)**

**FAC 6900**

**BFR Required N**

**690 30 CLASSIFIED MATERIAL INCINERATOR / SHREDDER (NO BUILDING) (EA)**

**FAC 6900**

**BFR Required N**

**FACILITIES CRITERIA (FC)**  
**FACILITY PLANNING FOR NAVY AND**  
**MARINE CORPS SHORE INSTALLATIONS**

**Series 700: Housing and Community Facilities**

**Record of Changes:**

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of Change</b>
30 Sept 2016	740 82	Golf Storage/Maintenance Facility	Added new Category Code for Golf storage and maintenance facilities
30 Sept 2016	740 80	Golf Clubhouse	Revised category code to reflect new category code 740 82
8 Feb 2018	711 20	Wherry Housing - Enlisted	Renamed Title to WHERRY HOUSING and consolidated 711 21-24 into 711 20, deleted 711 21-24
8 Feb 2018	711 25	Capehart Housing	Renamed title to CAPEHART HOUSING THRU O6, consolidated 711 26-28 into 711-25, deleted 711 26-28
8 Feb 2018	711 30	Fund Housing 1950-Thru-1969-Enlisted	Renamed Title to FAMILY HOUSING-ENLISTED-THRU-O6, consolidated 711 31-33 into 711 30, deleted 711 31-33
8 Feb 2018	711 34	Fund Housing 1950-Thru-1969 - O7-Thru-O10	Renamed title to FAMILY HOUSING-O7-THRU-O10
8 Feb 2018	711 35	Leased Housing - Enlisted	Renamed title to LEASED HOUSING THRU O6, consolidated 711 36-38 into 711 35, deleted 711 36-38
8 Feb 2018	711 40-43	Fund Housing	Consolidated into 711 30 and deleted
8 Feb 2018	711 44	Fund Housing Before-1950 -O7-Thru-O10	Consolidated into 711 34 and deleted
8 Feb 2018	711 45	Relocatable Housing - Enlisted	Renamed title to RELOCATABLE HOUSING
8 Feb 2018	711 46-49	Relocatable Housing (Various)	Consolidated into 711 45 and deleted
8 Feb 2018	711 50	Surplus-Commodity Housing - Enlisted	Renamed title to SURPLUS-COMMODITY HOUSING
8 Feb 2018	711 54	Surplus-Commodity Housing - O7-Thru-O10	Consolidated into 711 50 and deleted

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of Change</b>
8 Feb 2018	711 56-58	Foreign Source Housing, (Various)	Consolidated into 7C1 55 and deleted
8 Feb 2018	711 60	Inadequate Lanham Housing - P.L. 85-241	Consolidated into 711 30
8 Feb 2018	711 60-63	Inadequate Housing – (Various)	Deleted
8 Feb 2018	711 64	Wherry Housing – Un-acquired	Deleted
8 Feb 2018	711 65	Rental-Guarantee Housing	Consolidated into 711 30 and deleted
8 Feb 2018	711 70-73	Fund Housing (Various)	Consolidated into 711 30 and deleted
8 Feb 2018	711 74	Fund Housing After-1969 -O7-Thru-O10	Consolidated into 711 34 and deleted
8 Feb 2018	711 75-76	Manufactured Housing, Enlisted, Officer	Consolidated into 711 30 and deleted
8 Feb 2018	711 78	Family Housing-Base Operating Support Contractor	Consolidated into 711 30 and deleted
8 Feb 2018	713 10	Trailer-Sites -For Gov't Owned Trailers	Deleted
8 Feb 2018	714 77	Housing - Detached Miscellaneous Storage	Renamed title HOUSING - MISCELLANEOUS STORAGE
8 Feb 2018	721 11	Bachelor Enlisted Quarters E1/ E4	Renamed title UNACCOMPANIED ENLISTED HOUSING
8 Feb 2018	721 12-13	Bachelor Enlisted Quarters (Various)	Consolidated into 721 11 and deleted
8 Feb 2018	721 14	Class A Student Barracks	Renamed title STUDENT HOUSING
8 Feb 2018	721 15	Recruit Type Barracks	Renamed title RECRUIT BARRACKS
8 Feb 2018	721 17	Officer Candidate School (OCS)	Consolidated into 721 14 and deleted
8 Feb 2018	721 18	Naval Academy Preparatory School (Naps)	Consolidated into 721 14 and deleted
8 Feb 2018	721 19	Broadened Opportunity For Officer Selection Training (Boost)	Consolidated into 721 14 and deleted



Date	CCN #	CCN Title	Description of Change
8 Feb 2018	721 21	Transient Quarters - Mission Essential	Consolidated into 740 95 and deleted
8 Feb 2018	721 24-26	Bachelor Enlisted Quarters – Marines (Various)	Consolidated into 721 11 and deleted
8 Feb 2018	721 30	Civilian Barracks - Gs01/ Gs06	Consolidated into 721 11 and deleted
8 Feb 2018	721 31	Civilian Barracks - Base Operating Support Contractor	Consolidated into 721 11 and deleted
8 Feb 2018	721 40	Disciplinary Barracks	Renamed title DISCIPLINARY HOUSING
8 Feb 2018	721 41	Marine Corps UDP Barracks (Enlisted,) BH Mobilization	Renamed title UNIT DEPLOYED PERSONNEL (UDP) – MISSION ESSENTIAL (ENLISTED)
8 Feb 2018	721 45	Dining Facility Built-In / Attached	Renamed title to GALLEY/MESS HALL BUILT-IN/ATTACHED
8 Feb 2018	721 46	Berthing - Naval Home	Renamed title to RESIDENTIAL CARE FACILITY
8 Feb 2018	721 51-53	Transient Personnel Unit Barracks (Various)	Consolidated into 721 11 and deleted
8 Feb 2018	722 10	Enlisted Dining Facility	Renamed title to GALLEY/MESS HALL
8 Feb 2018	722 31	Dining Facility Detached - Civilian Personnel	Consolidated into 722 10 and deleted
8 Feb 2018	722 35	Austere Dining Facility	Renamed title to AUSTERE GALLEY
8 Feb 2018	722 41	Dining Facility Detached - Commissioned Personnel	Consolidated into 722 10 and deleted
8 Feb 2018	722 50	Cold Storage Detached From Galley	Renamed title to COLD STORAGE DETACHED FROM GALLEY/MESS HALL
8 Feb 2018	722 60	Conference Center - Bachelor Housing Operated	Renamed title to CONFERENCE CENTER
8 Feb 2018	723 40	Garage Detached - Bachelor Housing	Renamed Title To GARAGE DETACHED - UNACCOMPANIED HOUSING
8 Feb 2018	724 11	Bachelor Officers Quarters Permanent Party W1/W2 & 01/02	Renamed title to UNACCOMPANIED OFFICER HOUSING
8 Feb 2018	724 12	Bachelor Officers Quarters Permanent Party W3-W5 & 03up	Consolidated into 724 11 and deleted

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of Change</b>
8 Feb 2018	724 13-14	Bachelor Officers Quarters Transient (Various Ranks)	Consolidated into 740 94 and deleted
8 Feb 2018	724 15	Marine Corps UDP Barracks (Officer,) BH Mobilization	Renamed title to UNIT DEPLOYED PERSONNEL (UDP) – MISSION ESSENTIAL (OFFICER)
8 Feb 2018	724 22-23	Civilian Quarters (Various)	Consolidated into 724 11 and deleted
8 Feb 2018	724 24	Officer Indoctrination School (OIS)	Consolidated into 721 14 and deleted
8 Feb 2018	724 30	Commissioned Officers Mess - Closed (Built-In/Attached)	Consolidated into 722 10 and deleted
8 Feb 2018	740 20	Temporary Lodging Facilities (Navy Lodge)	Renamed title to PCS OFFICIAL LODGING
8 Feb 2018	740 22	Transient Housing	Consolidated into 740 94 and deleted
8 Feb 2018	740 81	MWR Rental Accommodation	Renamed title to MWR RENTAL ACCOMMODATIONS
8 Feb 2018	740 94	Visitor's Quarters (NGIS Single Mission Support Rooms)	Renamed title to TDY OFFICIAL LODGING
8 Feb 2018	740 95	Visitor's Quarters (NGIS Mission Support Suites)	Renamed title to LIMITED SERVICE OFFICIAL LODGING
13 June 2018	752 40	Athletic Stadium	CCN added
13 June 2018	735 40	School Playground	CCN deleted and assets remapped to CCN 75110 due to deletion of FAC code 7354 from RPCS by OSD.
13 June 2018	751 10	Playground	CCN name changed from "Community Playgrounds" to "Playground".
28 May 2019	730 85	Post Office	Clarified verbiage in the "notes" section to better define population used to calculate SF allowance
14 August 2019	730 22	NCIS Field Office	Added new category code.
14 August 2019	740 58	MWR Operated catering facility	Change title to MWR Catering Facility.
14 August 2019	750 33	Pool/pump/filter/treatment facility- remote	Change title to: Pool/pump/filter/treatment facility
14 August 2019	723 50	Wash Rack-Detached	Changed FAC code and UM

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of Change</b>
14 August 2019	730 22	NCIS Field Office	CCN added.
14 August 2019	740 26	Installation Restaurant (MWR)	Consolidated into 740 04 and deleted.
14 August 2019	740 58	MWR Operated Catering Facility	Change title to MWR Operated Catering and Conference Center.
14 August 2019	744 80	Golf Storage/Maintenance Facility	CCN added.
14 August 2019	750 33	Pool/pump/filter/treatment facility- remote	Change title to: Pool/Pump/Filter/Treatment Facility
23 July 2020	Table 710.2	Navy and Marine Corps Personnel Averages (1992 Data)	Table deleted.
23 July 2020	711 45	Relocatable Housing	CCN deleted as Real Property but remains in iNFADS for inventory purposes for USMC.
23 July 2020	721 45	Galley/Mess Hall Built-In / Attached	Consolidated into 722 10 and deleted.
23 July 2020	730 45	Dependent School-Nursery School	Consolidated into 730 61 and deleted.
23 July 2020	722 10	Galley/Mess Hall	Added section 72210-4.7 which provides criteria for planning facilities of more than 2500 PN
23 July 2020	740 28	Amusement Center / Recreation Mall	Consolidated into 740 42 and deleted.
23 July 2020	740 33	Car Wash Structure	CCN added.
23 July 2020	740 52	Gun / Skeet And / Or Trap Building	Consolidated into 74090 and deleted.
23 July 2020	740 42	Community Recreation Center	Title changed from "Fleet Recreation Center"
23 July 2020	740 54	MWR/Military Recreation Center (Single Sailor/Marine Ctr.)	Consolidated into 740 42 and deleted.
23 July 2020	740 91	MWR Operated Car Wash	Consolidated into either 740 32 (building) or 740 33 (structure) and deleted.
23 July 2020	741 40	Private/Organization Club Building	CCN added.
23 July 2020	750 34	Wading Pool/Splash Pool	Consolidated into 750 30 and deleted.

Date	CCN #	CCN Title	Description of Change
23 July 2020	750 58	Recreational Campground-Tent	Consolidated into 750 59 and deleted.
23 July 2020	750 59	Recreational Campground-RV	Title changed from Recreational Campground-RV to Recreational Campground.
30 Sep 2020	750 59	Recreational Campground	Changed UM to acres (AC)
30 Sep 2020	730 22	NCIS Field Office	Criteria developed for CCN 73022. NCIS references removed from 730 20.
27 August 2021	740 54	MWR/Military Recreation Center (Single Sailor/Marine Center)	Category Code 740 54, MWR Military Recreation Center, is deleted.  Data in CCN 740 54 is consolidated into CCN 740 42, Community Recreation Center.
3 November 2021	730 76	Military Working Dog Kennel	Changed title from "Kennel - Military Working Dog Kennel" to "Military Working Dog Kennel".
3 November 2021	740 32	Car Wash Building	Changed title to "Car Wash Building".
13 December 2021	730 66	Miscellaneous Personnel Weather	Changed BFR Required to N.
13 December 2021	730 75	Public Toilet	Changed BFR Required to N.
3 March 2022	730 22	NCIS Field Office	Exception rule added for evidence storage space types.
18 May 2022	721 11	Unaccompanied Enlisted Housing	The criteria was updated commensurate with the March 2022 update of design UFC 4-721-10N.
17 August 2022	711-56	Family Housing High Rise	Add new category code.
17 August 2022	723-31	Standalone Kitchen	Add new category code.
17 August 2022	724-20	USNA Unaccompanied Housing	Add new category code.
17 August 2022	740-31	POV Filling Station	Add new category code.

Date	CCN #	CCN Title	Description of Change
17 August 2022	730-76	Military Working Dog Kennel	Change title from Military Working Dogs to Military Working Dog Kennel.
2 Mar 2023	700 Series	UFC 2-000-05N	Change UFC 2-000-05N to FC 2-000-05N document due to the fact that this planning criteria is not unified among the other DoD services.
17 Mar 2023	722-35	Austere Galley	Change URL to access Appendix FC 2-000-05N Appendix F.
17 Mar 2023	730-10	Fire Station	Change URF to access Fire Station Space Program spreadsheet and FC 4-730-10N Navy and Marine Corps Fire Stations.
17 Mar 2023	730-10, Section 73010-8	Fire Station	Change URL to access Space Planning Spreadsheet.
17 Mar 2023	740 Series, Section 740-1.4	Community Facilities	Change URL to access Navy Minimum Standards for AT/FP.
17 Mar 2023	740-25 and Section 74025-4.4	Family Services Center	Change URL to Access Design Criteria UFC 4-730-01. Change URL to access to UFC 4-730-03.
17 Mar 2023	740-37	MWR Outdoor Recreation Center	Change URL to access UFC 4-740-03.
17 Mar 2023	740-44 and Section 74044-5	Indoor Physical Fitness Center	Change URL to access Design UFC 4-740-02 and Fitness Program Spreadsheet.
17 Mar 2023	740-49	Austere Indoor Physical Fitness Center (Gym)	Change URL to access Appendix F Austere Facilities (Navy).
17 Mar 2023	740-53-2.2	Swimming Pool – Indoor (Including Poolside Deck)	Change URF to access design criteria on swimming pools.
17 Mar 2023	740-55 and Section 74055-5	Youth and School Age Care Center	Change URL to access UFC 4-740-06. Change URL to access Space Program Spreadsheet.
17 Mar 2023	740-74 and Section 74074-3	Child Development Center	Change URL to access Child Development Center Space Program Spreadsheet. Change URL to access FC 4-740-14N. Change URL to access Child Development Center Space Program Spreadsheet.
1 Dec 2023	740-04	Exchange Food Service	Modify title and description.
1 Dec 2023	740-32	NEX Car Wash Building	Modify title and description

Date	CCN #	CCN Title	Description of Change
1 Dec 2023	740-33	MWR Car Wash Structure	Modify title and description.
1 Dec 2023	750-36	Copper COAX CCTV and CATV Lines	Modify title and description.
1 Dec 2023	740-82	Golf Storage / Maintenance Facility	Delete Category Code. This function is captured in Category Code 74480 – Golf Storage Maintenance Facility.
1 Dec 2023	730-76	Military Working Dog Kennel	Complete update of space requirements.
15 Jan 2024	740-06	Non-Exchange Installation Restaurant (MWR)	Add new category code.

## 700 SERIES HOUSING AND COMMUNITY FACILITIES

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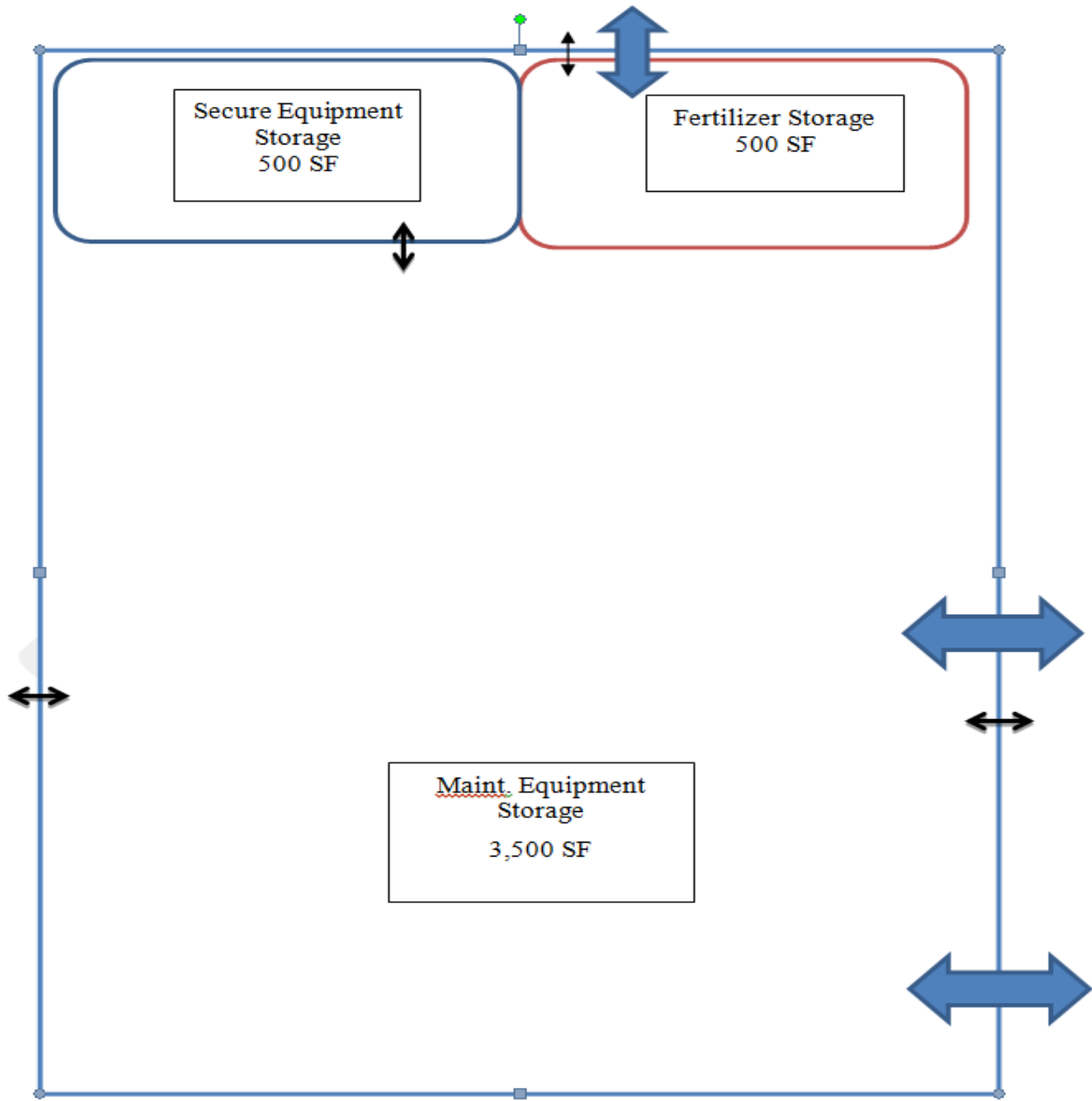
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## 710 FAMILY HOUSING

For Design Criteria, refer to UFC 4-711-01 “Family Housing”

### 710-1 DESCRIPTION

A family housing requirement exists for all Navy and Marine Corps military and key civilian personnel with dependents. Housing will not be programmed where the local housing market has the capacity to provide suitable rental housing for military facilities.

### 710-2 BASIC CATEGORY GROUPS

The basic categories of facilities included in the 710 Family Housing group are shown in Table 710-1.

**Table 710-1 Basic Categories of Facilities in the 710 Group**

Group Code	Description
711	Family Housing – Dwellings and Attached Garages
712	Family Housing – Mobile Homes (Substandard)
713	Family Housing – Mobile Home Parks
714	Family Housing – Detached Facilities

### 710-3 GROSS HOUSING REQUIREMENT

The gross housing requirement for a naval installation is based on the number of eligible personnel with dependents. Eligible personnel are commissioned officers, warrant officers, or enlisted members and key civilian employees. Students in these categories are included if they are on permanent change of station orders for courses of 20 or more weeks. The gross housing figure for a base may be developed from its planned personnel strength projected as far as reliable estimates are available, or from a study of the base table of organization, utilizing the marriage factors developed from an actual survey of personnel assigned to a similar installation.

## 711 FAMILY HOUSING - DWELLINGS AND ATTACHED GARAGES

Design Criteria: refer to UFC 4-711-01 “Family Housing” for Detailed Guidance, Sample Calculations & Tables of acceptable Land Use Intensity Ratios.

71120 Through 71176-1 REQUIREMENTS. Public quarters for eligible military personnel will be planned as indicated in section 710. Housing for key civilian personnel

with dependents will be planned on an individual basis. Government-owned or controlled housing will be provided for all eligible personnel required to reside on-station by reason of military necessity, and for other eligible personnel for whom it is impracticable to obtain adequate private housing at reasonable rentals and locations.

71120 Through 71176-1.1 Net Housing Requirements. In computing net housing requirements, existing housing in the following category codes will be considered as assets against gross requirements:

1. Wherry housing un-acquired.
2. All adequate public quarters.
3. All private housing leased for use as public quarters.
4. All rental guaranty housing (in foreign countries).
5. All public quarters under construction or authorized and approved for construction.
6. Private units approved for leasing but not yet under contract.
7. Rental guaranty units under the contract or approved for development.

**71120 through 71176-1.1.1 Non-Federal Government Rental Housing.** In addition, existing private and local government rental housing (including mobile homes) in which military personnel are accepted as tenants, will be considered as suitable community support and will be charged as assets against requirements in all cases where it is classed as satisfactory by the occupant. If not classed as satisfactory by the occupant, or if vacant, it will be considered suitable provided it meets the following criteria:

**71120 through 71176-1.1.1.1 Location.** The distance from the administrative area of the installation can be traversed by privately-owned vehicle in one hour or less during rush hours.

**71120 through 71176-1.1.1.2 Cost.** Rent plus utilities (except telephone) does not exceed 115% of the member's Basic Allowance for Quarters (BAQ) plus Variable Housing Allowance (VHA).

**71120 through 71176-1.1.1.3 Condition.** Must be complete dwelling unit with private entrance with bath and kitchen for sole use of occupant and so arranged that both kitchen and bathrooms can be entered without passing through bedrooms. The units must be well constructed and in good condition of repair with heating (if required) and kitchen equipment provided. It must be in a residential area not subject to offensive fumes, industrial noises, and other objectionable features.

**71120 through 71176-2 Land Use Intensity.** The optimum land use intensity for family housing has been established by the Department of Defense. The following

parameters are to be considered in determining the land use intensity ratio for a particular site:

1. Floor area
2. Living space
3. Recreation space
4. Open space

**711 20 WHERRY HOUSING (SF)**

**FAC: 7110**

**BFR Required: N**

**711 25 CAPEHART HOUSING (SF)**

**FAC: 7110**

**BFR Required: N**

**711 29 CAPEHART HOUSING – O7 THROUGH O10 (SF)**

**FAC: 7110**

**BFR Required: N**

**711 30 FAMILY HOUSING (SF)**

**FAC: 7110**

**BFR Required: N**

**711 34 FAMILY HOUSING– O7 THROUGH O10 (SF)**

**FAC: 7110**

**BFR Required: N**

**711 35 LEASED HOUSING (SF)**

**FAC: 7110**

**BFR Required: N**

**711 39 LEASED HOUSING – O7 THROUGH O10 (SF)**

**FAC: 7110**

**BFR Required: N**

**711 50 SURPLUS-COMMODITY HOUSING (SF)**

**FAC: 7110**

**BFR Required: N**

**711 55 FOREIGN-SOURCE HOUSING (SF)**  
**FAC: 7110**  
**BFR Required: N**

**711 56 FAMILY HOUSING HIGH RISE (SF)**  
**FAC: 7113**  
**BFR Required: N**

71156-1 **DESCRIPTION.** This type of facility is a building equal to or greater in height than 7 stories above ground level, which contains family housing units/apartments. Associated space may include lobby, multipurpose room, restrooms, elevator banks, utility/control rooms, and emergency generators.

**711 59 FOREIGN-SOURCE HOUSING – O7 THROUGH O10 (SF)**  
**FAC: 7110**  
**BFR Required: N**

## **713 FAMILY HOUSING – MOBILE HOME PARKS**

713-1 **DESCRIPTION.** This group includes single and/or double wide manufactured housing parking sites with appurtenant utility connections; roads; walks; storage sheds; laundry and community buildings; and recreational facilities.

71310-1 The use of government-owned trailers for the purposes of Family Housing is not authorized. No criteria are available.

**713 11 MOBILE HOME PARK (SY)**  
**FAC: 7130**  
**BFR Required: N**

71311-1 **DESCRIPTION.** This group includes single and/or double wide manufactured housing parking sites with appurtenant utility connections; roads; walks; storage sheds; laundry and community buildings; and recreational facilities.

71311-2 **REQUIREMENTS.** The number of trailer sites is computed from a specific study and are provided only when private facilities are not available. The sites are self-supporting – tenants supply their own trailers, pay site rent, and receive BAQ.



**714 FAMILY HOUSING – DETACHED FACILITIES**

714-1 **DESCRIPTION.** Detached facilities are structures separated from family quarters, but available to the occupants.

**714 10 DETACHED GARAGES (SF)****FAC: 7141****BFR Required: N**

Design Criteria: See UFC 4-711-01 “Family Housing”

71410-1 **REQUIREMENTS.** Detached garages are planned on the basis of one per living unit and a space allowance of one vehicle per garage at those locations subject to temperatures of -10° Fahrenheit and below or where extreme winds, salt air, or sandstorms require garages. See UFC 4-711-01 “Family Housing” for detailed guidance.

**714 20 DETACHED CARPORTS (SF)****FAC: 7141****BFR Required: N**

Design Criteria: See UFC 4-711-01 “Family Housing”

71420-1 **REQUIREMENTS.** Detached carports are also provided on the basis of one per living unit and a space allowance of one vehicle per carport. See UFC 4-711-01 “Family Housing” for detailed guidance.

**714 30 FAMILY HOUSING - OTHER DETACHED BUILDINGS (SF)****FAC: 7143****BFR Required: N****714 31 FAMILY HOUSING - OTHER DETACHED FACILITIES (EA)****FAC: 7143****BFR Required: N**

71430/71431-1 **DESCRIPTION.** These codes are for inventory purposes only and are to be used for minor detached buildings and facilities directly relating to a particular family dwelling.

**714 32 COMMUNITY CENTER (SF)****FAC: 7143****BFR Required: N**

**Design Criteria:** See UFC 4-711-01 "Family Housing" for specific criteria and procedures for planning FHCC's.

71432-1 **DESCRIPTION.** A Family Housing Community Center (FHCC) provides space for social and recreational programs at family housing projects where comparable Navy or non-navy facilities are not reasonably accessible.

71432-2 **ESTABLISHING AN FHCC.**

71432-2.1 **Authorization -** The establishment of an FHCC must be authorized by NAVFAC Assistant Commander for Family Housing (FAC 08) or Commandant of the Marine Corps (LFL).

71432-2.2 **Justification:** Normally the establishment of an FHCC should be considered only for housing projects with 250 or more family units. FHCC in support of smaller projects at isolated locations will be considered on a case by case basis.

71432-3 **REQUIREMENTS.** A typical FHCC may provide spaces for assemblies, games, hobbies and crafts, conferences, and other functions in direct support of the FHCC operation. The design emphasis will be placed on flexible space arrangements and multipurpose space utilization. Also consider indoor-outdoor function interrelationships. The size of the facility is determined by user requirements.

**714 33 HOUSING WELCOME CENTER (SF)**

**FAC: 7143**

**BFR Required: N**

71433-1 **DESCRIPTION.** A Family Housing Welcome Center (HWC) provides space for administrative and service functions associated with the provisions of Government and private sector housing. The establishment of a HWC must be authorized by NAVFAC Assistant Commander for Family Housing (FAC 08) or Commandant of the Marine Corps (LFF-3).

71433-2 **REQUIREMENTS.** When authorized, the size of a HWC is based upon user requirements using 610-10 criteria.

**714 77 HOUSING MISCELLANEOUS STORAGE (SF)**

**FAC: 7142**

**BFR Required: Y**

71477-1 **REQUIREMENTS.** Detached storage facilities in support of family housing will be provided only where it can be individually justified. There are no criteria for this type of facility. General information on normal stacking height, SF per measurement ton requirements, and other parameters are provided in category code 440 series.

71477-2 **MARINE CORPS.** This category code is not intended for Marine Corps use.

## **720 UNACCOMPANIED PERSONNEL HOUSING**

### **721 ENLISTED UNACCOMPANIED PERSONNEL HOUSING (PN)**

See FC 4-721-10 for design criteria.

721-1 Enlisted Unaccompanied Personnel Housing encompasses bachelor quarters for Permanent Party Enlisted Navy and Marine Corps personnel and Transient Enlisted Navy and Marine Corps personnel. Unaccompanied housing for civilian personnel shall be provided at remote installations located away from municipal areas.

721-2 Unaccompanied Enlisted Housing (UEH) for the Navy refers to apartment style, hotel style, dormitory style living quarters, and open bay barracks for recruits. If messing facilities are attached to unaccompanied personnel housing, use category code 721-45 to delineate the mess hall portion. For detached mess halls, use category group 722.

#### **GENERAL NAVY UEH POLICY**

721-2 The Enlisted Unaccompanied Personnel Housing programming requirements are derived from the Unaccompanied Housing Requirements Determination Report (R19). The R19 delineates the Effective Permanent Party Program Requirements on line 15 through analysis of personnel base loading against the projected housing inventory. At Marine Corps installations, use the Facilities Support Requirement (FSR) document issued annually by HQMC. For broad planning and programming purposes where survey figures are not available, the quarter requirements may be determined by contacting the Unaccompanied Housing Program Management Office.

The following policy outlines housing for single enlisted military personnel:

- Provide open-bay housing on the installation for recruits at the Regional Training Centers such as Great Lakes.
- House all E1-E3 single sailors on the installation.
- When in homeport, all single sailors with the rank of E1-E3 and sailors with the rank of E4 with less than 4 years of service are to be housed on the installation.
- One resident advisor per 20 E1-E3 sailors housed is authorized.

- Sailors with the rank of E4 with more than 4 years of service will be accommodated with housing on the installation where adequate quarters are available.
- Provide housing on the installation for military personnel for reasons of training and military necessities, acknowledged as “must house” on the installation.

## DEFINITION OF TERMS

The following definitions are included to clarify important terminology for developing Basic Facilities Requirements (BFRs) and UH projects.

Bedroom - Sleeping area in net square feet per person; excludes the closets, kitchen, food preparation area, and bathroom area.

UH 2+0 Unit - Includes double occupancy living/sleeping area, two personal closets, a separated toilet and shower compartment, and a single bowl lavatory/vanity in the service area.

UH 1+1E Unit- Includes two occupancy living/sleeping area, four personal closets, a separated toilet and bath compartment, a double bowl lavatory/vanity, and a kitchenette.

Market Style Unit - Two bedroom/two bath apartment with living/dining room, full kitchen, laundry, and two personal closets per bedroom. One bedroom/one bathroom apartment with living/dining room, full kitchen, laundry, and two personal closets per bedroom for remote locations only when authorized.

Navy (NETC) 2+0 Dormitory Unit- Includes double occupancy living/sleeping area, two personal closets, shared toilet with a separated shower compartment, and a single bowl lavatory in the service area.

### Military Necessity

1. Augmented military personnel; military personnel assigned to transient personnel units while awaiting ship's movement or separation from Navy service;
2. Military personnel on temporary duty (TDY) regarding duty for further assignment (TEMUDFURAS) orders, waiting for medical boards;
3. Military personnel on orders for executing limited duty, or sailors under direction from the command to be housed temporarily in unaccompanied housing (UH) due to restricted duty; military protective orders; cool down, etc.

Mission Essential Housing – Housing that supports rotational / mobilized sailors outside of their homeport and crewmembers of uninhabitable ships / submarines at their normal homeport, and rotational units outside of their normal homeport.

Officer Accessions – Any of several programs that provide personnel to assume positions as commissioned officers.

Permanent Party Sailors

1. Military personnel who executed orders for permanent change of station to an installation or to units supported by the installation to include units designated as unusually arduous sea duty for purposes of housing allowances in homeport;
2. Crew members of uninhabitable ships /submarines at their normal homeport, and rotational units (air squadrons, mobile training units, Seabees, etc.) in homeport.

Recruits - Personnel undergoing basic military training who have no continuous prior enlisted service (active or reserve).

Resident Advisors - Personnel who have volunteered and been selected, because of their maturity, to live in unaccompanied housing to assist in maintaining good order and discipline and to act as mentors to E1-E3 personnel..

Rotational/Mobilized Sailors- Sailors attached to units that are “Sea Duty for rotational purposes” (air squadrons, mobile training units, Seabees, etc.) on orders as a unit to duty outside their homeport, individuals on orders to a combat zone or crewmembers of uninhabitable ships/submarines outside their normal homeport.

Training Necessity - Training programs including officer accessions (OTC) and enlisted initial skills training (“A” schools, accessions pipeline schools, etc.) where student housing is part of the training mission and separate from other unaccompanied housing, and students are considered “must house” on the installation.

**721 11 ENLISTED UNACCOMPANIED PERSONNEL HOUSING**

**FAC: 7210**

**BFR Required: Y**

**As of Feb 2018, this CCN also includes the consolidation of the following related housing CCNs:**

- **721 12, 721 13 Bachelor Enlisted Quarters (Various). See section 72111-1**
- **721 24, 721 25, 721 26 Bachelor Enlisted Quarters – Marines (Various). See section 72111-2**
- **721 30 Civilian Barracks - GS01/ GS06. See section 72111-3.**

- 721 31 Civilian Barracks - Base Operating Support Contractor. See section 72111-4.
- 721 51, 721 52, 721 53 Transient Personnel Unit Barracks (Various). See section 72111-5.

The aforementioned CCNs have been deleted from this document and from iNFADS.

### 72111-1 Navy Assignment Standards

Permanent Party Unaccompanied Housing for enlisted Navy personnel applies to E1-E4<4 (E4 with less than 4 years of service), E4>4 years-E6, and E7-E9 rank designations.

**Important Note:** Permanent Party Unaccompanied Housing shall be identified on all property records in the internet Assets Facility Data Store (iNFADS) based on Navy military enlisted rank as follows;

- 721-11 E1-E4<4 years of service
- 721-11 E4>4years of service-E6
- 721-11 E7-E9

See FC 4-721-10 for design criteria.

#### Permanent Party

The market style unit applies to this category. Each unit includes shared living/dining area and kitchen/laundry area. For E1-E3 sailors and E4 sailors with less than 4 years' service, provide a two bedroom/two bath unit to accommodate four persons with each bedroom/bathroom to be shared by sailors.

Mission Essential Housing – Housing that supports rotational / mobilized sailors outside of their homeport and crewmembers of uninhabitable ships / submarines at their normal homeport, and rotational units outside of their normal homeport.

#### Mission Essential/Military Necessity

The Navy Shared Mobilization Unit (formerly referred to as Navy 2+0) applies to this category. Each unit includes one bedroom, one full bathroom, one kitchenette/service area and two closets. The unit accommodates either two E1-E6 sailors or one E7-E9 sailor.

## Reference Requirements

Table 72111-A includes space planning guidelines per housing unit.

**TABLE 72111-A  
PLANNING LEVEL METRICS per UNIT/PLAN**

UNIT/PLAN	MAXIMUM ALLOWABLE GROSS BUILDING AREA Ft <sup>2</sup> (m <sup>2</sup> )
Navy Market Unit 2-Bed/2-Bath	606 ft <sup>2</sup> (56.3 m <sup>2</sup> ) per bedroom, based on a two-bedroom unit. This maximum is not applicable for one-bedroom units.
Navy Market Unit 1-Bed/1-Bath	1,028 ft <sup>2</sup> (95.5 m <sup>2</sup> ) per bedroom, based on a one-bedroom unit.
Navy NETC 2+0 Dormitory Unit / Navy 2+0 Unit	595 ft <sup>2</sup> (55.3 m <sup>2</sup> ) per plan
Marine Corps 1+1E Room (OCONUS Japan)	817 ft <sup>2</sup> (76 m <sup>2</sup> ) per plan
Marine Corps 2+0 Room	595 ft <sup>2</sup> (55.3 m <sup>2</sup> ) per plan
Marine Corps Officer Plan	855 ft <sup>2</sup> (79.4 m <sup>2</sup> ) per plan
Open Bay Plans	140 ft <sup>2</sup> (13 m <sup>2</sup> ) per person housed

Refer to Tables 72111-B and 72111-C for assignment policy. All construction projects shall identify maximum occupancy or the number of E1-E4<4 personnel that can occupy the quarters and the intended use capacity. The intended use capacity cannot exceed the number from the Unaccompanied Housing Requirements Determination (R-19) report except for rounding purposes. Activities in CONUS, where facilities include an architectural style that is prominent balcony access, may request a waiver from the interior corridor style from NAVFACHQ BHPO. **In these cases where the balconies serve as the primary circulation (i.e., serving exterior room entrances), they count towards building gross area at 100%.** For high threat areas OCONUS, consider secure barracks design concepts such as locating all UH rooms toward base interior with single-loaded exterior corridors located toward the base perimeter.

## NAVY PLANNING CRITERIA FOR NEW CONSTRUCTION AND RENOVATION

Example Shared Mobilization Unit  
(Formerly Navy 2+0 unit)

3 Stories or less

Above 3 stories\*\*

Maximum Allowable Gross  
Building Area per Unit

55.3 m<sup>2</sup>

57.3 m<sup>2</sup>

\*\* For construction over 3 stories, 2 additional square meters per unit is allowed. The additional 2 square meters must be identified as a separate line item on the DD1391. This also applies to special design requirements for historical preservation, etc.

Example Market Style Unit	<u>3 Stories or less</u>	<u>Above 3 stories**</u>
Maximum Allowable Gross Building Area per Bedroom / Bathroom based on a Two-Bedroom Unit	56.3 m <sup>2</sup>	58.3 m <sup>2</sup>

\*\* For construction over 3 stories 2 additional square meters per bedroom/bathroom is allowed. The additional 2 square meters per bedroom/bathroom must be identified as a separate line item on the DD1391. Also applies to special design requirements for historical preservation, etc.

MARKET UNIT BUILDING COMMON AREAS (See FC 4-721-10N for specific details)

- Corridors
- Interior Stairways
- Elevators (optional/per local building code requirements)
- Mechanical, Electrical, and Telecommunications Rooms
- Building Mechanical/Electrical room and Telecommunications room
- Trash Chute Area
- Janitorial Room
- Vestibule and Lobby Areas
- Reception/Front Desk Area
- Storage Room(s)
- Public Make and Female Restrooms
- General Maintenance Room
- Multi-Purpose Room(s)
- Vending Area
- Linen/Housekeeping Room

**TABLE 72111-B  
NAVY PERMANENT PARTY – MARKET STYLE UNACCOMPANIED HOUSING**

RANK/RATE	UNIT TYPE	OSD MINIMUM STANDARDS OF ACCEPTABILITY*	PLANNING CRITERIA FOR NEW CONSTRUCTION
<b>E7 - E9 (721-13)</b>	Market Style one bedroom/one bath  Housing accommodation in remote locations	Private unit with one bedroom/one bath, living/dining area, and kitchen/laundry area, shall be provided in remote locations. Provide a minimum of 13.4 net m <sup>2</sup> (144 nsf) per bedroom area.	One bedroom/one bath, one closet, one living/dining area, and one kitchen/laundry occupied by one person. Maximum allowable gross building area for one bedroom/bathroom Market Style Unit is 95.5 m <sup>2</sup> (1,028 gsf).
<b>E4&gt;4 - E6 (721-12)</b>	Market Style two bedroom/two bath	Shared unit with two bedrooms/two baths, living/dining area, and kitchen/laundry area. Provide a minimum of 13.4 net m <sup>2</sup> (144 nsf) per bedroom area.	Two bedrooms/two baths each occupied by one person with shared living/dining area and kitchen/laundry area. Maximum allowable gross building area for two-bedroom Maximum allowable gross building



RANK/RATE	UNIT TYPE	OSD MINIMUM STANDARDS OF ACCEPTABILITY*	PLANNING CRITERIA FOR NEW CONSTRUCTION
			area per 2-bedroom unit or 620 gsf.
<b>E1-E3 – E4&lt;4 (721-11)</b>	Market Style two bedroom/ two bath	Shared unit with two bedrooms/two baths, living/dining area, and kitchen/laundry area. Provide a minimum of 13.4 net m <sup>2</sup> (144 nsf) per bedroom area.  Provide one resident advisor per 20 E1-E3 military personnel.	Two bedrooms/two baths each occupied by two persons with shared living/dining area and kitchen/laundry area. Maximum allowable gross building area per 2-bedroom unit or 620 gsf.

\* OSD minimum standards of acceptability apply to billeting management rather than to facility condition for NFADB reporting purposes.

**TABLE 72111-C  
NAVY MISSION ESSENTIAL OR MILITARY NECESSITY - SHARED MOBILIZATION  
UNACCOMPANIED HOUSING (NAVY 2+0)**

RANK/RATE	UNIT TYPE	OSD MINIMUM STANDARDS OF ACCEPTABILITY*	PLANNING CRITERIA FOR NEW CONSTRUCTION
<b>E7 - E9 (721-13)</b>	Shared Mobilization/Navy 2+0 Unit - one bedroom and one bath	Private unit with one bedroom, service area with kitchenette, bathroom vanity compartment and separate toilet/shower compartment. Provide a minimum of 16.7 net m <sup>2</sup> (180 nsf) per bedroom area.	One sleeping room and one bath, 55.3 gross m <sup>2</sup> (595 gsf) per unit, includes closets and service area/kitchenette for one occupant.
<b>E4 - E6 (721-12)</b>	Shared Mobilization/Navy 2+0 Unit- one bedroom and one bath	Shared unit with one bedroom, service area with kitchenette, bathroom vanity compartment and separate toilet/shower compartment to accommodate two persons. Provide a minimum of 16.7 net m <sup>2</sup> (180 nsf) per bedroom area.	One sleeping room and one bath, 55.3 gross m <sup>2</sup> (595 gsf) per unit, includes closets and service area/kitchenette for two occupants.
<b>E1 - E3 (721-11)</b>	Shared Mobilization/Navy 2+0 Unit - one bedroom and one bath	Shared unit with one bedroom, service area with kitchenette, bathroom vanity compartment and separate toilet/shower compartment to accommodate two persons. Provide 16.7 net m <sup>2</sup> (180 nsf) per room.	One sleeping room and one bath, 55.3 gross m <sup>2</sup> 595 gsf) per unit, includes closets and service area/kitchenette for two occupants.

\* OSD minimum standards of acceptability apply to billeting management rather than to facility condition for NFADB reporting purposes.

## RELATED FACILITIES

Unaccompanied Housing should be collocated with an unaccompanied housing check-in center. Consideration should also be given to collocating UH with single sailor service centers, food service facilities, fitness facilities and other MWR facilities. One car wash area with a water source and an oil separator will also be provided when these type facilities are not available within a reasonable commuting distance. The car wash and supporting features must be captured under CCN 72350 "Wash Rack-Detached".

## PARKING FOR NAVY PERMANENT PARTY PERSONNEL

See CCN 852-10 for parking requirements.

Note: Some Activities may have unique circumstances that require less parking. In these cases, parking will be based on a parking survey of current residents.

## OUTSIDE RECREATION

Provide one full outdoor basketball court per 300 residents if not available within 1/2 km. Similar outdoor recreation facilities can be substituted. Picnic areas and barbecue areas are required for all Unaccompanied Housing.

## RESTORATION – MODERNIZATION PROJECT GUIDANCE

All deficiencies within existing facilities regarding "condition and configuration," including Quality of Life (QOL) deficiencies defined by the Unaccompanied Housing Assessment Program (UHAP) shall be identified and addressed on restoration and modernization projects. Design projects for modernization and restoration projects shall comply with OPNAVINST 11010.20H, Navy Facilities Projects, which stipulates major policy guidance. Restoration and Modernization projects shall comply in accordance with the following:

- Perform an economic analysis and/or business case analysis to determine the feasibility of whether renovation or new construction is more cost effective.
- Do not plan projects exclusive to meet new construction criteria, except where the condition and/or configuration of an existing facility is too deficient to economically correct.
- Redesigns shall adjust unit designs to work within existing structural constraints to maximize building area while minimizing investment costs.
- Freestanding columns are allowed in redesigned units, provided that they do not interfere with a functional area or use.

## REPAIR STANDARDS

Repair work may be limited to original standards used for the existing buildings. Consult OPNAVINST 11010.20H, Naval Facilities Projects, for additional guidance on repair projects.

### 72111-2 Marine Corps Assignment Standards

Permanent Party Unaccompanied Housing for enlisted Marine Corps personnel applies to E1-E4, E5, and E6-E9 rank designations.

**Important Note:** Permanent Party Unaccompanied Housing shall be identified on all property records in the internet Assets Facility Data Store (iNFADS) based on Marine Corps military enlisted rank as follows;

- 721-11 E1-E4
- 721-11 E5
- 721-11 E6-E9

#### Permanent Party 2+0 Standard

The 2+0 room consists of one room with a bath and is sized for two enlisted E1-E3 or one enlisted E4-E9. Refer to Table 72111-D. There are two basic entry styles for the 2+0 style hotels: exterior corridor style and interior corridor style. All construction projects will identify maximum occupancy or the number of E1-E3 personnel that can occupy the quarters and the intended use capacity. The intended use capacity cannot exceed the number from the FSR except for rounding purposes. See FC 4-721-10 for design criteria.

The Marine Corps may only use the 1+1 module design when individually approved by the CMC.

## MARINE CORPS PLANNING CRITERIA FOR NEW CONSTRUCTION AND RENOVATION

2+0 Room	<u>3 Stories or less</u>	<u>Above 3 stories or more**</u>
Maximum Allowable Gross Building Area per Unit	55.3 m <sup>2</sup>	57.3 m <sup>2</sup>

\*\* For construction over 3 stories 2 additional square meters per bedroom/bathroom is allowed. The additional 2 square meters per bedroom/bathroom must be identified as a separate line item on the DD1391. Also applies to special design requirements for historical preservation, etc.

**BUILDING COMMON SPACE OUTSIDE OF THE ROOM**

The typical shared common space to be provided for all 2+0 standard plans is shown below. Required common spaces are to be provided except when similar facilities are already available within walking distance of the project. Services should not be duplicated.

**REQUIRED BUILDING AREAS** (See FC 4-721-10N for specific details)

- Circulation, corridors and/or balcony access
- Multi-Purpose Room
- Duty Office
- Duty Bunk
- Laundry facilities
- Building utility room
- Entry Vestibule
- Unisex Rooms
- Elevators
- Janitor Closets
- Mechanical and Electrical Equipment Room(s)
- Corridors and Breezeways
- Stair Towers

**Optional Common Spaces** (See FC 4-721-10N for specific details)

- Administrative/Office Space
- Vending
- Game Rooms
- Resident bulk storage, as required
- Centralized Kitchen
- Balconies are optional

**TABLE 72111-D  
MARINE CORPS UNACCOMPANIED HOUSING  
2+0 ROOM**

<b>RANK/RATE</b>	<b>OSD MINIMUM STANDARDS OF ACCEPTABILITY*</b>	<b>PLANNING CRITERIA FOR NEW CONSTRUCTION (Permanent Party)</b>
<b>USMC E6 - E9 (721-26)</b>	Private bedroom and bath. Minimum bedroom area is 151 ft <sup>2</sup> (56 m <sup>2</sup> ).	Private room and bath, living room, and kitchen areas, and one closet at 2m <sup>2</sup> . Bedroom net area is 151 ft <sup>2</sup> . Gross room area is 603 ft <sup>2</sup> (56 m <sup>2</sup> ).  New construction of SNCO barracks will be considered on a case-by-case basis.
<b>USMC E4-E5 (721-25)</b>	Private room and a bath shared with not more than two to a room. Minimum 16.7 m <sup>2</sup> (180 SF) net living area per bedroom.	Private room and bath plus service area at 180 ft <sup>2</sup> (16.7 m <sup>2</sup> ) net sleeping/ living area plus bath and two closets at 2 m <sup>2</sup> net area each. Gross room area is 387.5 ft <sup>2</sup> (36 m <sup>2</sup> ).
<b>USMC E1-E3 (721-24)</b>	Not more than two to a room. Minimum of 16.7 m <sup>2</sup> (180 SF) net living area per bedroom.	Shared room and bath plus service area occupied by two persons at 180 ft <sup>2</sup> (16.7 m <sup>2</sup> ) net sleeping/ living area plus shared bath and two closets at 2 m <sup>2</sup> net area each. Gross room area is 387.5 ft <sup>2</sup> (36 m <sup>2</sup> ).

\* OSD minimum standards of acceptability apply to billeting management rather than to facility condition for NFADB reporting purposes.

## **PARKING FOR MARINE CORPS PERMANENT PARTY PERSONNEL**

See CCN 852-10 for parking requirements.

Note: Some overseas or CONUS Activities may have unique circumstances that require less parking. In these cases, parking will be based on a parking survey of current residents.

## **OUTSIDE RECREATION**

Provide one sand-volleyball court and one full outdoor basketball court per 300 residents if not available within 1/2 km. Similar outdoor recreation facilities can be substituted. Picnic areas and barbecue areas are required for all unaccompanied personnel housing.

**OUTSIDE INDIVIDUAL MILITARY WASH AREA (USMC)**

Provide outdoor equipment wash facilities (when required) at USMC unaccompanied personnel housing. The number of faucets/wash outlets shall be determined by the installation commander/resident FMF unit.

**72111-3 Civilian Barracks – GS01/GS06 (PN)**

72111-3.1 **DESCRIPTION** Quarters and messing facilities for civilian grades GS-6 and below will be provided only at installations that are remote from municipal areas or where civilians are required to be housed on station for security reasons.

72111-3.2 **REQUIREMENTS** Facilities planning for civilians will be the same as for military personnel of equivalent rank. Table 72111-E provides the military and civilian schedule of equivalent grades as established by the Department of Defense.

**Important Note:** Permanent Party Unaccompanied Housing shall be identified on all property records in the internet Assets Facility Data Store (iNFADS) based on Marine Corps military enlisted rank as follows;

**TABLE 72111-E  
MILITARY AND CIVILIAN EQUIVALENT GRADE SCHEDULE**

Military Grade Group	Civilian Grade Group	
Rank	General Schedule	Wage Grade System
E-7 to E-9	GS-6	WS-1 through WS-7 WL-1 through WL-5 WG-9 through WG-11
E-5 to E-6	GS-5	
E4	GS-4	WG-1 through WG-8
E1 to E-3	GS-1 to GS-3	

**72111-4 Civilian Barracks – Base Operating Support Contractor (PN)**

There is no criteria currently available for this type of facility. Contact NAVFAC Atlantic Design and Construction business line for current information.

**72111-5 Transient Personnel Units Assignment Standard (Inventory Purpose)**

Transient housing for enlisted Navy and Marine Corps applies to E1-E4, E5-E6, and E7-E9 rank designations.

**Important Note:** This category of facilities is for inventory purposes and has no separate criteria. Transient Unaccompanied Housing where applicable shall be identified on all property records in iNFADS based on enlisted Navy and Marine Corps military rank as follows.

- 721-11 E1-E4
- 721-11 E5-E6
- 721-11 E7-E9

Hotels for Transient Personnel Units (TPU) are covered under Transient Unaccompanied Housing. TPUs may be used for operational reasons such as medical holds, transfers, disciplinary problems, etc. Refer to Category Codes 740-95 (Limited Service Official Lodging-Mission) for planning criteria.

**721 14 STUDENT HOUSING (PN)**

**FAC: 7213**

**BFR Required: Y**

Design Criteria: refer to FC 4-721-10N

72114-1 **REQUIREMENTS:** The requirements support housing students in a Naval Education and Training Command (NETC) 2+0 Dormitory Unit. The unit provides double occupancy living/sleeping area, two closets for personnel, a share toilet with a separate shower compartment, and a single bowl lavatory. All construction projects will identify the maximum occupancy or occupancy according to E1-E3, E4-E6, and E7-E9 enlisted personnel rank.

**72114-2 NAVY NETC 2+0 DORMITORY UNIT**

<b>2+0 module</b>	<b>3 Stories or less</b>	<b>Above 3 stories or more**</b>
Maximum Allowable Gross Building Area per Unit	55.3 m <sup>2</sup>	57.3 m <sup>2</sup>

\*\* For construction over 3 stories, 2 additional square meters per bedroom/bathroom is allowed. The additional 2 square meters per bedroom/bathroom must be identified as a separate line item on the DD1391. Also applies to special design requirements for historical preservation, etc.

72114-3 **PARKING** Automobile parking for the residents at Navy 'A' Schools and USMC School of Infantry must be provided. Parking criteria can be found in category code 852 10. In addition, provide motorcycle parking spaces and bicycle parking

spaces as required in accordance with historical use quantities. Provide visitor parking for 1% of the residents.

**72114-4 BUILDING COMMON SPACE OUTSIDE OF THE MODULE** For each project, all shared spaces must be individually scoped and justified from the list below. Elevators will not be provided. Items to be counted as one-half scope include stairs and stairwells, enclosed or unenclosed; and vertical chases.

- Office Areas: Admin/Reception (9.3 m<sup>2</sup> typical), Master at Arms (9.3 m<sup>2</sup> typical)
- Communal Areas: Vestibule, lobby, large screen TV lounge, vending room, gang kitchen, gang laundry, public telephone alcove, public toilets, resident bulk storage
- Corridor circulation, mechanical/electrical rooms (5-10% of gross building size), janitor closets (each floor), housekeeping/linen, utility storage room

**72114-5 PARKING FOR RECRUITS AND USMC SCHOOL OF INFANTRY** Resident parking at USMC and Navy recruit barracks is not required. Provide 1% visitor parking at USMC and Navy recruit barracks, however handicapped spaces are not required.

**721 15 RECRUIT BARRACKS (PN)**  
**FAC: 7218**  
**BFR Required: Y**

Design Criteria: refer to FC 4-721-10N

**72115-1 DESCRIPTION** Recruit quarters are open bay, central head facilities with net living area sized as one equal share of the open bay sleeping area. Typical sizes are 60 people per bay. Open bay designs will be constructed only for recruits, receiving barracks, and USMC School of Infantry.

**72115-2 PLANNING CRITERIA FOR NEW CONSTRUCTION FOR 721 15**

**Open Bay**

Net Sleeping Area	6.7 m <sup>2</sup>
Common Area / Circulation / MEC	6.3 m <sup>2</sup>
Building gross m <sup>2</sup> per module	13.0 m <sup>2</sup>

Also, see Table 72115-A.



**Table 72115-A  
Recruit Barracks**

RANK/RATE	OSD MINIMUM STANDARDS OF ACCEPTABILITY*	PLANNING CRITERIA FOR NEW CONSTRUCTION
Recruit & Receiving Barracks, and USMC School of Infantry	Open bay; central bath. Minimum 6.7 net m <sup>2</sup> (72 SF) net living area per person.	Open bay with individual armories in lieu of closets; central bath. Minimum 6.7 net m <sup>2</sup> (72 SF) net sleeping area.

#### **721 21 TRANSIENT QUARTERS – MISSION ESSENTIAL**

**This CCN has been consolidated into CCN 740 95 for legacy facilities. All new transient facilities are captured under CCN 74094. CCN 721 21 has been deleted.**

#### **721 40 DISCIPLINARY HOUSING (PN)**

**FAC: 7312**

**BFR Required: Y**

**72140-1 DESCRIPTION** This Facility is to be used for berthing personnel in disciplinary holding of restricted status. The Disciplinary/Restricted Barracks may be an area within a regular enlisted or transient personnel quarters that is designated by the commanding officer for use as:

72140-1.1 Disciplinary Holding Barracks. Berthing facilities for personnel in a holding status pending legal or administrative action or when assigned extra duty status.

72140-1.2 Restricted Barracks. Berthing for personnel undergoing punitive restriction or restriction in lieu of arrest. Personnel under punitive restriction will not be co-mingled with personnel restricted in lieu of arrest.

**72140-2 REQUIREMENTS** OPNAVINST 1626 provides detailed policy and description of security features utilized in Disciplinary/Restricted Barracks. Berthing space will be in open bay with a minimum of 72 SF net living area per person. The facility is not located within an approved place of confinement (Brig).

**721 41 UNIT DEPLOYED PERSONNEL (UDP) MISSION ESSENTIAL (ENLISTED), (SF)**  
**FAC: 7214**  
**BFR Required: Y**

72141-1 **DESCRIPTION:** These facilities are used for housing enlisted Marine Corps Unit Deployment Program (UDP) personnel (for officer UDP housing, see CCN 72415). Criteria is being developed for this CCN. Consult with the Marine Corps Housing Command Director (GF-3) for interim requirements for BFR purposes.

**721 45 GALLEY/MESS HALL BUILT-IN / ATTACHED (SF)**

**This CCN has been deleted. All existing assets should be reassigned to CCN 72210 GALLEY/MESS HALL**

**721 46 RESIDENTIAL CARE FACILITY (SF)**  
**FAC: 7210**  
**BFR Required: Y**

**There is no criteria currently available for this type of facility. Contact NAVFAC Atlantic Design and Construction business line for current information.**

**721 47 UNACCOMPANIED HOUSING FOR WOUNDED WARRIORS (SF)**  
**FAC: 7215**  
**BFR Required: Y**

72147-1 No criteria for this facility type are currently available.

72151/52/53-1 **DESCRIPTION** Hotels for Transient Personnel Units (TPU) are covered under category code numbers 721-51/52/53. TPUs may be used for operational reasons such as medical holds, transfers, disciplinary problems, etc. Refer to Category Codes 721-21/22/23 for planning criteria. This category code is for inventory purposes and has no separate criteria.

**722 UNACCOMPANIED HOUSING – MESS AND CONFERENCE FACILITIES**

722-1 **DESCRIPTION** This group includes dining facilities for unaccompanied personnel and conference centers operated by Unaccompanied Housing that are located in, or adjacent to, Unaccompanied Housing facilities. For clubs and open mess facilities, see the appropriate codes in 740 series. For additional information, refer to the design criteria found in FC 4-722-01N "Navy and Marine Corps Dining Facilities".

**722 10 GALLEY / MESS HALL (PN)**  
**FAC: 7220**  
**BFR Required: Y**

Design Criteria: Refer to FC 4-722-01N “Navy and Marine Corps Dining Facilities”

72210-1 **DESCRIPTION.** Dining facilities for enlisted personnel provide the functional space necessary to offer efficient and aesthetically pleasing food service facilities that improve the quality of life for military personnel living and working on military installations worldwide.

72210-2 **REVIEW.** The Basic Facility Requirements and project documentation related to the planning for new or renovation of existing Dining Facilities are subject to review by Commander, Navy Installations Command (CNIC) Code N925 for Navy projects, or Headquarters Marine Corps, Logistics Food Service (LFS-4) for USMC projects.

72210-3 **REQUIREMENT.** Planning for a dining facility requires a determination of the number of personnel to be served; the meal schedule, duration and turnover to establish the required seating capacity, and any additional functions (such as a Flight Kitchen) which will be accommodated and require space in the facility. These requirements are generated by following three basic steps:

- Step 1) determination of the authorized population which must be served by a dining facility (refer to Chapter 1 of this publication for additional guidance),
- Step 2) analysis of existing adequate dining facilities within an acceptable travel distance to supplement the dining requirement, and
- Step 3) determination of the space allocation requirement for the population not served by existing facilities.

72210-3.1 Step 1 – Determination of Population Served.

The number of enlisted personnel to be served during a meal period shall be determined by multiplying the projected maximum unaccompanied housing occupancy by the mission utilization factor(s), as provided in Table 72210-A.

The population count may include the average number of shipboard sailors entitled to rations-in-kind while shipboard galley facilities are out of service.

Do not include personnel on separate rations in the serving requirements when planning new dining facilities, or retaining and modernizing permanent facilities.

Officers and civilians shall only be included in the projected occupancy in overseas or remote locations where support is required.

72210-3.2 Step 2 - Analysis of Existing Facilities

New dining facilities shall be justified based on the ability to show that the existing dining facilities are inadequate to provide the serving requirement for the utilizing population established in Step 1.

The BFR for dining facilities requires an evaluation of the capacity, age, condition, and location of existing dining facilities relative to work centers and housing areas.

New dining facilities are not justified solely to support the construction of an additional unaccompanied personnel housing increment. It is necessary to determine that existing dining facilities do not adequately support the mission.

Recent changes in food service operations have made it necessary to re-evaluate the capacities of existing dining facilities which were constructed utilizing earlier criteria. While overall square foot authorization for new facilities is generally applicable to the determination of capacities of existing facilities, there are many independent factors which will limit capacity and must be taken into account. Common examples of these limiting parameters are:

- Storage Capacity include dry foods, refrigerated and frozen foods, consumables, and other non-food goods.
- Service Capacity – The ability to sustain a service rate suitable for the population to be served within the service period.
- Equipment Capacity
- Seating Capacity
- Meal Periods – The amount of time that the dining facility is open.
- Service Period – The amount of time that meal lines are open.

72210-3.3 Step 3 – Determination of Space Requirements

Based on the population to be served (as established in Step 1), and deducting any excess service capacity in existing dining facilities (as determined in Step 2), the required space allowance is determined from the remaining unserved population using the guidance provided in paragraph 72210-4.

**Table 72210-A  
Mission Utilization Factors for Dining Facilities**

Mission	Utilization Factor
<b>Training</b>	
Basic and/or Recruit Training	95 %
Service Schools	85 %
<b>Permanent Party</b>	
Construction Battalions	70 %
Naval Stations	70 %
Personnel Transfer and Overseas Processing Centers	50 %
Remote Locations (1)	90 %

Mission	Utilization Factor
Shipyards	70 %
Weapon Stations	70 %
<b>Brig</b>	100 %

- (1) Defined as a location with minimal available other feeding sources, on- or off-installation

72210-4 **SPACE PLANNING ALLOWANCES.** The space allowance for dining facilities is provided in Table 72210-C, based on the population established in paragraph 72210-3.

72210-4.1 Assumptions. The data contained in Table 72210-C is based on the following assumptions:

- Preparation method is conventional cook-serve.
- Mission is basic or recruit training.
- Seating is based on 15 SF (1.4 SM) per seat.
- Lobby queuing, and circulation space is minimized.
- One serving line is needed for every 200 seats, with minimum of 2 lines.
- Baking operations are minimized and reflect minimum bake-off of pre-prepared dough or other items.
- Three meals per day are served, seven days per week.
- Dishwashing space reflects a rack dish machine.
- Bussing method is self-buss to remote dish room.
- No provisions for catering are allocated, except Field Feeding/Vat Chow.
- Beverages are a free standing self-serve counter.
- Staff toilets do not include showers.

72210-4.2 Net to Gross Area Factor. – The net-to-gross multiplier accounts for mechanical and other utility space, wall thicknesses and other construction requirements. It typically ranges from 15 to 25% of all net areas for dining facilities and is influenced by the demands of the mechanical system, the number of floors, and the overall functional layout of the building. After selecting the appropriate net-to-gross factor, it is then applied to the facility subtotal shown in Table 72210-C.

72210-4.3 Additional Spaces. – Space allocation for vestibules, interconnecting covered walks, enclosed corridors and other architectural devices for climate and comfort are not included in Table 72210-C and must be

considered separately on the BFR, if the need is fully justified. Aesthetic embellishments which add space to dining facilities are not justifiable.

72210-4.4 Storage Capacity. – Storage area requirements typically range from 10% to 25% of the dining facility net area (public, preparation, serving and support areas) and include dry foods, refrigerated and frozen foods, consumables, and other non-food goods. Factors that influence the storage requirements are the method of preparation and the inventory period:

- Scratch preparation has different fresh, dry and refrigerated storage requirements from frozen convenience and pre-prepared (cook-chill) preparation. The mix of preparation methods must be known to correctly size and design the storage areas.
- Inventory period is the time between deliveries. It will be influenced by the facility location (CONUS vs. OCONUS and rural/remote vs. urban areas), facility mission, and the vendor location and delivery contract terms. The longer the inventory period, the larger the storage requirements.

Table 72210-B provides a grid of these storage capacity factors and net area requirements associated with different combinations of factors. The appropriate net area gain is then applied to the facility subtotal shown in Table 72210-C.

**Table 72210-B  
Estimated Storage Requirements**

Inventory Period Factors	Food Preparation Factors	
	Frozen / cook-chill	Scratch
Often (urban)	10-15% of net area	15-20% of net area
Infrequent (rural/remote)	15-20% of net area	20-25% of net area

72210-4.3 Service Capacity – A properly equipped and manned regular meal serving line can sustain a service rate of 8 personnel per minute. A properly equipped and manned short-order to-order serving line can sustain a service rate of 5 personnel per minute.

72210-4.4 Seating Capacity – Seating capacity is determined by the total number of patrons to be served divided by the turnover rate. Turnover rates can vary according to the size of facility and seating capacities.

72210-4.5 Meal Periods – The local command determines the meal period.

72210-4.6 Service Period – For planning purposes the total service time should not be less than 72 minutes or more than 142 minutes.

72210-4.7 Dining facilities that require more space than the maximum shown in Table 72210-C can be determined as follows: Divide the increased (projected) demand/loading capacity by the max of 2200 (personnel) shown in 72210-C. This will yield a multiplier greater than 1. Apply this multiplier to the allowances shown for the specific areas within the different functional components (Public, Serving, Preparation, and Support Areas) for 2200 personnel. Calculate the subtotals for the functional components and finish by using the process given for calculating storage adjustments and computing net-to-gross area as shown in the table. Below is an example:

A new Dining Facility is required to accommodate 3500 personnel (pn).

Divide the 3500 pn capacity requirement by the current Table 72210-C maximum allowance of 2200 pn; the result is a factor of 1.59.

Using the maximum allowances for the functional components of the 2200 pn facility, work through the calculations as follows:

Public Areas:	13,140 nsf x 1.59 = 20,892.6 nsf
Serving Areas:	4,288 nsf x 1.59 = 6,817.9 nsf
Preparation Areas:	4,335 nsf x 1.59 = 6,892.7 nsf
Support Areas:	2,440 nsf x 1.59 = 3,879.6 nsf
Facility Subtotal:	38,482.8 nsf
Multiply by Storage req %:	x1.25%
Subtotal Including Storage:	48,103.5 nsf
Multiply by the facility net-to-gross:	x1.25%
Facility Total Requirement:	60,129.4 gsf

(Note: If a flight kitchen is required, add it to the final facility gsf requirement)

**Table 72210-C  
Space Criteria for Enlisted Personnel Dining Facilities**

Functional Components		Facility Size Classifications							
		1-80		81-150		151-250		251-400	
		Personnel Served		Personnel Served		Personnel Served		Personnel Served	
		62 Min. Seats		108 Min. Seats		116 Min Seats		172 Min Seats	
		1.3 Max. Turnover		1.4 Max Turnover		2.2 Max Turnover		2.3 Max Turnover	
		ft. <sup>2</sup>	m <sup>2</sup>	ft. <sup>2</sup>	m <sup>2</sup>	ft. <sup>2</sup>	m <sup>2</sup>	ft. <sup>2</sup>	m <sup>2</sup>
Public Areas	Dining Area and Circulation	935	86.9	1630	151.4	1875	174.2	3000	278.7
	Public Toilets	180	16.7	200	18.6	220	20.4	250	23.2
	Queue	130	12.1	250	23.2	325	30.2	500	46.5
	Sign-in Station	40	3.7	40	3.7	40	3.7	60	5.6
	<b>Subtotal</b>	<b>1285</b>	<b>119.4</b>	<b>2120</b>	<b>196.9</b>	<b>2460</b>	<b>228.5</b>	<b>3810</b>	<b>353.9</b>
Serving Areas	Regular Food Line	250	23.2	320	29.7		0.0		0.0
	Fast Food Line		0.0		0.0		0.0		0.0
	Combination Food Line		0.0		0.0	420	39.0	620	57.6
	Beverage Line	200	18.6	250	23.2	350	32.5	500	46.5
	Cashier Station	30	2.8	30	2.8	50	4.6	50	4.6
	Dish Washing	180	16.7	250	23.2	320	29.7	380	35.3
	<b>Subtotal</b>	<b>660</b>	<b>61.3</b>	<b>850</b>	<b>79.0</b>	<b>1140</b>	<b>105.9</b>	<b>1550</b>	<b>144.0</b>
Preparation Areas	Kitchen	650	60.4	800	74.3	600	55.7	845	78.5
	Vegetable Preparation		0.0		0.0	220	20.4	255	23.7
	Meat Preparation		0.0		0.0		0.0		0.0
	Bakery		0.0		0.0		0.0		0.0
	Utensil Wash		0.0		0.0	175	16.3	220	20.4
	<b>Subtotal</b>	<b>650</b>	<b>60.4</b>	<b>800</b>	<b>74.3</b>	<b>995</b>	<b>92.4</b>	<b>1320</b>	<b>122.6</b>
Support Areas	Offices	230	21.4	310	28.8	400	37.2	580	53.9
	Staff Toilets	260	24.2	260	24.2	260	24.2	260	24.2
	Staff Lockers		0.0		0.0	120	11.1	160	14.9
	Janitor's Closet	25	2.3	25	2.3	25	2.3	50	4.6
	Can Wash	40	3.7	40	3.7	40	3.7	40	3.7
	Loading Dock (at 50%)	200	18.6	200	18.6	200	18.6	230	21.4
	<b>Subtotal</b>	<b>755</b>	<b>70.1</b>	<b>835</b>	<b>77.6</b>	<b>1045</b>	<b>97.1</b>	<b>1320</b>	<b>122.6</b>
<b>FACILITY SUBTOTAL</b>		<b>3,350</b>	<b>311.2</b>	<b>4,605</b>	<b>427.8</b>	<b>5,640</b>	<b>524.0</b>	<b>8,000</b>	<b>743.2</b>
Storage ranges from 10 to 25% of Facility Subtotal									
Net-to-Gross ranges from 15 to 25% of Facility Subtotal									
Flight Kitchen*		100	9.3	100	9.3	100	9.3	100	9.3
<b>FACILITY TOTAL</b>		To be determined based on storage and net-to-gross		To be determined based on storage and net-to-gross		To be determined based on storage and net-to-gross		To be determined based on storage and net-to-gross	

\* The flight kitchen is a staging area where food products are assembled and packaged for delivery to aircraft. Not all locations will require a flight kitchen.



**Table 72210-C (continued)**  
**Space Criteria for Enlisted Personnel Dining Facilities**

Functional Components		Facility Size Classifications							
		401-650		651-1000		1001-1500		1501-2200	
		Personnel Served		Personnel Served		Personnel Served		Personnel Served	
		288 Min Seats		345 Min Seats		460 Min Seats		575 Min Seats	
		2.3 Min Turnover		2.9 Min Turnover		3.3 Min Turnover		3.8 Min Turnover	
		ft. <sup>2</sup>	m <sup>2</sup>	ft. <sup>2</sup>	m <sup>2</sup>	ft. <sup>2</sup>	m <sup>2</sup>	ft. <sup>2</sup>	m <sup>2</sup>
Public Areas	Dining Area and Circulation	4700	436.6	6320	587.1	7565	702.8	11000	1021.9
	Public Toilets	300	27.9	320	29.7	340	31.6	370	34.4
	Queue	750	69.7	1000	92.9	1100	102.2	1650	153.3
	Sign-in Station	80	7.4	100	9.3	120	11.1	120	11.1
	<b>Subtotal</b>	<b>5830</b>	<b>541.6</b>	<b>7740</b>	<b>719.0</b>	<b>9125</b>	<b>847.7</b>	<b>13140</b>	<b>1220.7</b>
Serving Areas	Regular Food Line	600	55.7	650	60.4	1050	97.5	1300	120.8
	Fast Food Line	600	55.7	650	60.4	650	60.4	650	60.4
	Combination Food Line		0.0		0.0		0.0		0.0
	Beverage Line	650	60.4	700	65.0	810	75.2	1056	98.1
	Cashier Station	100	9.3	150	13.9	200	18.6	250	23.2
	Dish Washing	450	41.8	600	55.7	730	67.8	1032	95.9
	<b>Subtotal</b>	<b>2400</b>	<b>223.0</b>	<b>2750</b>	<b>255.5</b>	<b>3440</b>	<b>319.6</b>	<b>4288</b>	<b>398.4</b>
Preparation Areas	Kitchen	1000	92.9	1100	102.2	1285	119.4	1600	148.6
	Vegetable Preparation	300	27.9	350	32.5	360	33.4	600	55.7
	Meat Preparation		0.0	240	22.3	300	27.9	500	46.5
	Bakery		0.0	690	64.1	825	76.6	1035	96.2
	Utensil Wash	330	30.7	400	37.2	500	46.5	600	55.7
	<b>Subtotal</b>	<b>1630</b>	<b>151.4</b>	<b>2780</b>	<b>258.3</b>	<b>3270</b>	<b>303.8</b>	<b>4335</b>	<b>402.7</b>
Support Areas	Offices	700	65.0	700	65.0	700	65.0	900	83.6
	Staff Toilets	360	33.4	430	39.9	450	41.8	500	46.5
	Staff Lockers	260	24.2	380	35.3	380	35.3	480	44.6
	Janitor's Closet	50	4.6	75	7.0	75	7.0	100	9.3
	Can Wash	40	3.7	60	5.6	60	5.6	60	5.6
	Loading Dock (at 50%)	300	27.9	300	27.9	400	37.2	400	37.2
	<b>Subtotal</b>	<b>1710</b>	<b>158.9</b>	<b>1945</b>	<b>180.7</b>	<b>2065</b>	<b>191.8</b>	<b>2440</b>	<b>226.7</b>
<b>FACILITY SUBTOTAL</b>		<b>11,570</b>	<b>1,074.9</b>	<b>15,215</b>	<b>1,413.5</b>	<b>17,900</b>	<b>1,662.9</b>	<b>24,203</b>	<b>2,248.5</b>
Storage ranges from 10 to 25% of Facility Subtotal									
Net-to-Gross ranges from 15 to 25% of Facility Subtotal									
Flight Kitchen*		125	11.6	125	11.6	150	13.9	150	13.9
<b>FACILITY TOTAL</b>		To be determined based on storage and net-to-gross		To be determined based on storage and net-to-gross		To be determined based on storage and net-to-gross		To be determined based on storage and net-to-gross	

\* The flight kitchen is a staging area where food products are assembled and packaged for delivery to aircraft. Not all locations will require a flight kitchen.

**722 35                   AUSTERE GALLEY (SF)**

72235-1       Facility planning criteria related to Austere Dining Facilities can be found in FC 2-000-05N - Appendix F "Austere Facilities (Navy)," located at [https://www.wbdg.org/FFC/DOD/UFC/fc\\_2\\_000\\_05n\\_appendixf.pdf](https://www.wbdg.org/FFC/DOD/UFC/fc_2_000_05n_appendixf.pdf).

72241-1       **DESCRIPTION.**   The operation of closed messes in support of unaccompanied officers' quarters is being discontinued. New Commissioned Officers' Closed Mess Facilities will not be planned for new or existing quarters.

**722 50                   COLD STORAGE DETACHED FROM GALLEY / MESS HALL (SF)**

**FAC: 7233**

**BFR Required: N**

72250-1       **DESCRIPTION.**   This code is for inventory purposes only, and applies to situations where cold storage facilities are detached from the galley facility. There is no additional space allowance for galley cold storage, and therefore this space must be provided from within the total allowance authorized for dining facilities.

**722 60                   CONFERENCE CENTER (SF)**

**FAC: 6100**

**BFR Required: N**

72260-1       **DESCRIPTION.**   This category code is for inventory purposes only, and includes only those conference rooms operated by Unaccompanied Housing. No specific criteria are provided.

72260-2       **CONVERSION OF EXISTING SPACES.** Existing unaccompanied housing may have spaces that are no longer required by current criteria or unaccompanied housing practices, such as lounges and galleys (attached or detached). If these spaces cannot be physically or economically converted to unaccompanied housing rooms, or a surplus of unaccompanied housing rooms exists at the activity and region, these spaces may be converted to conference rooms with the approval of the Regional PM for Unaccompanied Housing.

72260-3       **CONVERSION OF ROOMS.** Conversion of unaccompanied housing rooms into conference centers or meeting rooms is not allowed unless there is a projected surplus of unaccompanied housing rooms. In addition, the requirement for conference centers or meeting rooms cannot be used to justify new Unaccompanied Housing construction.

72260-4       **LOCATION.**       Conference rooms should preferably be located in, or adjacent to, transient quarters so conference attendees staying in transient quarters may take advantage of the proximity.

**723 UNACCOMPANIED PERSONNEL HOUSING - DETACHED FACILITIES****723 20 LATRINE DETACHED (SF)****FAC: 7234****BFR Required: N**

72320-1 **DESCRIPTION.** Latrine facilities are planned as an integral part of new unaccompanied housing. This category code is provided to inventory existing detached facilities only.

**723 30 LAUNDRY DETACHED (SF)****FAC: 7231****BFR Required: N**

72320/30-1 **DESCRIPTION.** Laundry facilities are planned as an integral part of new unaccompanied housing. This category code is provided to inventory existing detached facilities only.

**723 31 STANDALONE KITCHEN (SF)****FAC: 7233****BFR Required: N**

72330-1 **DESCRIPTION.** This category code is for inventory purposes only in cases where a kitchen is separate from galley/dining hall or other type of building.

**723 40 GARAGE DETACHED - UNACCOMPANIED HOUSING (VE)****FAC: 7232****BFR Required: N**

72340-1 **DESCRIPTION.** Individual garages will not be planned in conjunction with troop housing. This category code should be used for inventory purposes only. See CCN 730 80 for parking buildings.

**723 50 WASH RACK DETACHED (EA)****FAC: 8526****BFR Required: N**

72350-1 **DESCRIPTION.** Wash racks for mess hall garbage containers, and wash racks for unaccompanied housing resident's vehicles are planned as part of dining facilities and unaccompanied housing. This category code should be used for inventory purposes only.

**723 60 TROOP HOUSING – OTHER DETACHED BUILDINGS (SF)**  
**FAC: 7231**  
**BFR Required: N**

**723 61 TROOP HOUSING – OTHER DETACHED FACILITIES (EA)**  
**FAC: 7235**  
**BFR Required: N**

72360/61-1 **DESCRIPTION.** These codes are for inventory purposes only and are to be used for minor detached buildings and facilities directly relating to unaccompanied housing functions.

**723 77 TROOP HOUSING STORAGE (READY ISSUE/SHOP STORES/MISCELLANEOUS) (SF)**  
**FAC: 7231**  
**BFR Required: Y**

72377-1 **DESCRIPTION.** Storage facilities for miscellaneous equipment an/or goods related to unaccompanied housing support will be provided only where it can be individually justified. There are no criteria for this type of facility.

**724 UNACCOMPANIED PERSONNEL HOUSING - OFFICER QUARTERS (PN)**

**724 11 UNACCOMPANIED OFFICER HOUSING**  
**FAC: 7240**  
**BFR Required: Y**

Refer to CCN 721-11/12/13 “Permanent Party BEQ” for additional planning criteria.  
 Design Criteria: Refer to FC 4-721-10N “Unaccompanied Housing” for design criteria.

724-11/12/13/14-1 **DESCRIPTION.** Bachelor Officer Quarters (BOQ) will be planned for personnel in officers' grades who come within the following classifications:

- 72411/12/13/14-1.1 Permanent Party unaccompanied single
- 72411/12/13/14-1.2 Permanent Party unaccompanied married (overseas)
- 72411/12/13/14-1.3 Nurses
- 72411/12/13/14-1.4 Students
- 72411/12/13/14-1.5 Transients
- 72411/12/13/14-1.6 Rotational

72411/12/13/14-2 **REQUIREMENT.** The 1+1E module is sized for one O1-O10, W1-W5 personnel. Refer to Table 72411-1 for assignment policy. The intended capacity cannot exceed the number from the BHRD or Facilities Support Requirement (FSR) document. For CONUS, the only basic entry style for the 1+1E module is interior corridor style. CONUS activities with a predominate BQ architectural style of balcony access may request a waiver from the interior corridor style from NAVFACHQ BHPO. For high threat areas OCONUS, consider secure barracks design concepts such as all BEQ rooms facing base interior with single loaded, exterior corridors facing base perimeter.

**Table 72411-1  
Navy and Marine Corps Bachelor Officer Quarters**

RANK/RATE	OSD MINIMUM STANDARDS*	PLANNING CRITERIA FOR NEW CONSTRUCTION
O-3 - O-10 (724-12 and 724-14)	Private room consisting of a sleeping/living room, private bath, access to kitchen or officer's dining facility. Minimum 38 sq. m (400 NSF) net living area.	Living room and sleeping room occupied by one person, minimum 14.4 m <sup>2</sup> each; plus private bath, service area, approximately 3 net m <sup>2</sup> closets per room (total area). Module is 56.0 gross m <sup>2</sup> .
O-1-O-2 W-1-W-5 (724-11 and 724-13)	Private suite consisting of a sleeping/living room, private bath. Minimum 24 sq. m (250 NSF) net living area.	Living room and sleeping room occupied by one person, minimum 14.4 m <sup>2</sup> each; plus private bath, service area, approximately 3 net m <sup>2</sup> closets per room (total area). Module is 56.0 gross m <sup>2</sup> .

\* OSD minimum standards of acceptability apply to billeting management rather than to facility condition for NFADB reporting purposes.

72411/12/13/14-3 **OUTDOOR INDIVIDUAL MILITARY WASH AREA (USMC).** Provide outdoor equipment wash facilities (when required) at USMC bachelor quarters. The number of faucets/wash outlets shall be determined by the installation commander/resident FMF unit.

**724 15 UNIT DEPLOYED PERSONNEL (UDP) – MISSION ESSENTIAL (OFFICER) (SF)**  
**FAC: 7214**  
**BFR Required: Y**

72415-1 **DESCRIPTION.** These facilities are used for housing Marine Corps Unit Deployment Program (UDP) officers (for enlisted UDP housing, see CCN 72141). Criteria is being developed for this CCN. Consult with the Marine Corps Housing Command Director (GF-3) for interim requirements for BFR purposes.

72415-2 **DESCRIPTION.** Housing and messing facilities for civilian grades comparable to officers will be provided only at installations that are remote from municipal areas or where civilians are required to be housed on-station for security reasons.

72415-3 **REQUIREMENT.** Facilities planning for civilians will be the same as for military personnel of equivalent rank. Table 72415-1 provides the military and civilian schedule of equivalent grades as established by the Department of Defense.

**Table 72415-1  
 Military and Civilian Equivalent Grade Schedule**

Military Grade Group	Civilian Grade Group		
	General Schedule	Teachers (20 U.S.C. 901-907)	Wage System
0-7 to 0-10	GS-16 to GS-18	-----	-----
0-6	GS-15	_____	_____
0-5	GS-13 and GS-14	-----	WS-14 through WS-19 WL-15 and Production Support Equivalents
0-4	GS-12	Class IV and Class V	
0-3	GS-10 and GS-11	Class I, Step 5 Through Step 15 Class II and Class III	WS-8 through WS-13 WL-6 through WL-14 WG-12 through WS-15 and Production Support Equivalents
0-2 W-3 and W-4	GS-8 and GS-9	Class I, Step 3 and Step 4	

Military Grade Group	Civilian Grade Group		
	General Schedule	Teachers (20 U.S.C. 901-907)	Wage System
0-1 W-1 and W-2	GS-7	Class I, Step 1 and Step 2	

**724 20 USNA UNACCOMPANIED HOUSING (SF)**

**FAC: 7242**

**BFR Required: Y**

72420-1 **DESCRIPTION.** This type of housing is for unaccompanied housing buildings located at the US Naval Academy.

72423-1 No criteria for this facility are currently available.

72424-1 No criteria for this facility are currently available.

72430-1 The operation of closed messes in support of officers' quarters is being discontinued. New Commissioned Officers' Closed Mess dining facilities will not be planned for new or existing BOQ's.

**725 UNACCOMPANIED PERSONNEL HOUSING – EMERGENCY HOUSING**

**725 10 TROOP HOUSING - EMERGENCY BUILDING (PN)**

**FAC: 7250**

**BFR Required: Y**

**725 11 TROOP HOUSING - EMERGENCY FACILITY (EA)**

**FAC: 7251**

**BFR Required: N**

72510/11-1 **DESCRIPTION.** These may be hutments (Quonsets), tent frames with floors and may be permanent, semi-permanent, or temporary types of facilities. No criteria for these facilities are currently available.

## 730 COMMUNITY FACILITIES – PERSONNEL SUPPORT AND SERVICES

### 730 10 FIRE STATION (SF)

FAC: 7311

BFR Required: Y

Refer to <https://www.wbdg.org/ffc/dod/unified-facilities-space-program-sustainability-spreadsheets> for the “Fire Stations Space Program” spreadsheet.

Refer to UFC 4-730-10 “Fire Stations” for design criteria at <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-4-730-10>.

73010-1 **DEFINITION.** This space criteria applies to Installation fire station facilities which provide fire protection for structures, fight brushfires, and support fire prevention education and training.

73010-1.1 When the fire station function is part of a consolidated operations facility (fire/police/safety), this CCN is applicable only to the fire station functions and the planner must consider the appropriate space designation (such as CCN 730 20) for the other facility functions. Identify common support and administrative spaces that can be shared between CCN functional areas.

73010-1.2 This criteria shall be used in combination with CCN141-20 “Aircraft Fire and Rescue Station” when developing the total space allocation for CCN 141-25 “Combined Structural / Aircraft Fire / Rescue Station”.

73010-2 **REQUIREMENT.** The number of fire stations required on an Installation will be determined by the necessary response time for the type and function of facilities requiring fire protection. This analysis will be provided by Commander Navy Installations Command (CNIC) N30 or Marine Corps Installations Command (MCICOM) G3.

73010-3 **SCOPE.** To support the firefighters' mission, it is crucial that a fire station accommodates the equipment used at that station, supports the numerous unique functional requirements for that type of station, and fulfills the safety requirements of the firefighting personnel using the station. This is reflected in by the designated type of fire station and the required class of fire station.

73010-4 **STATION TYPES.** Functionally, there are three types of fire stations:

- Structural Stations (CCN 730 10) which provide fire protection to facilities,
- Aircraft Rescue Firefighting (ARFF) Stations (CCN 141 20) which provide fire protection to aircraft and associated equipment, and



- Combination Structural/ARFF Stations (CCN 141 25), providing support for each of the first two requirements.

73010-4.1 Differences between Station Types. Generally, the differences between Structural and ARFF stations are limited to the Apparatus Bay size criteria and the facility location to support its mission.

73010-4.2 Marine Corps Requirements. The Marine Corps program includes two separate organizations—one for Structural and one for ARFF. Unlike the other Services, the Marine Corps rarely combines the stations and requires separate offices for Fire Chiefs and other personnel on their Installations.

73010-5 **STATION CLASSES.** For each type of fire station, there are two class designations which determine some of the functions at that station:

- Headquarters (or Main) stations generally house the Fire Chief and most of the general administrative functions.
- Satellite stations are located throughout the Installation to provide adequate response time coverage.

73010-5.1 Differences between Station Classes. The differences between Headquarters and Satellite stations relate only to the additional administrative functions housed in the Headquarters station.

73010-6 **FUNCTIONS.** The Station Class will primarily determine the number and type of functional spaces required. However, it is important to assess the existing fire station assets available at the Installation, as it may be necessary to provide Satellite stations with some spaces normally reserved for Headquarters stations if they are not adequately available with existing facilities. The Installation representatives, in conjunction with the facility planner, must determine which spaces are necessary and justified. The planner should obtain a Needs Validation Assessment of Installation fire station assets to determine the class and required capacity in terms of personnel and vehicles of the new or renovated station (refer to 73010-2).

73010-7 **FUNCTIONAL AREAS.** Fire stations consist of apparatus bays and support areas, equipment and gear storage areas (for fire extinguishers, self-contained breathing apparatus (SCBA), protective clothing, hoses, firefighting agents, etc.), dispatch office, administrative offices, training facilities, living quarters, recreation and dining facilities, and possibly an emergency operations center and/or apparatus and equipment maintenance areas (if required by Installation mission requirements).

73010-8 **SPACE ALLOWANCE.** Space allowances for fire stations are determined according to the planning criteria calculations which result from using the Space Planning Spreadsheet for Fire Stations, which can be found at <https://www.wbdg.org/ffc/dod/unified-facilities-space-program-sustainability-spreadsheets>.

73010-8.1 Apparatus rooms are sized according to the firefighting apparatus to be housed within the station. For new construction, apparatus bays shall be planned to allow drive-through access for firefighting apparatus.

73010-8.2 Table 73010-1 contains functions that may be included in a fire station with adequate justification. These space allowances are optional selections in the space planning spreadsheet and must be individually justified for inclusion in the BFR development. Any additional apparatus equipment from Table 73010-1 should be included in determining the space allocation for apparatus bays.

**Table 73010-1. Validate Requirement for these Functional Areas**

FUNCTION	NOTE
Assistant Chief of Fire Prevention Office	(1)
Fire Prevention bureau	(2)
Deputy Chief's Office	(3)
Deputy Chief's Bunkroom	
Emergency Response Center	(4)
Disaster Preparedness Admin	(5)
Disaster Preparedness Storage	
Emergency Medical Services - Ambulance Bay	(6)
Ambulance Admin Space	
Ambulance Storage	
Ambulance Bunks (3 personnel/ambulance)	
Hazardous Waste Vehicle	(7)
Hazardous Waste Storage	
Hazardous Waste Bunks (3 personnel/vehicle)	
Specialized Equipment (foam unit, brush truck, etc.)	(8)
Heavy Rescue Vehicle	
Boat/Trailer Bay	
Boat Equipment Storage (100 NSF/9 NSM)	
Vehicle Maintenance Bay	(9)
Vehicle Maintenance Office	
Vehicle Maintenance Parts and Tools	

Notes:

- (1) Authorized where there are more than 4 inspectors.

- (2) Not included in Space Planning Spreadsheet. Determine space allowance according to CCN 610-10 criteria.
- (3) Authorized where there are 4 or more engine Companies.
- (4) Usually only provided in HQ-class stations that are consolidated with Police/Security/EMS functions.
- (5) Not included in Space Planning Spreadsheet. Determine space allowance according to CCN 610-10 criteria.
- (6) When ambulances are authorized, space must be provided to accommodate the vehicles, equipment, supplies, and crew.
- (7) When HazMat response team is authorized, space must be provided to accommodate the vehicles, equipment, supplies, and crew.
- (8) Include these specialized vehicles in the bay count section of the spreadsheet.
- (9) This space allocation in the spreadsheet is authorized only in cases where fire/rescue vehicles are maintained and/or repaired at the fire station.

### **730 11 FIRE HOSE DRYING STRUCTURE (EA)**

**FAC: 7311**

**BFR Required: N**

73011-1 **DEFINITION.** Category Code 730 11 is provided for inventory purposes only in cases where these structures are provided in a separate building or structure. For new facility planning purposes, this requirement shall be included as part of the Fire Station, Code 730 10.

### **730 12 FIRE CART/HOSE DRYING FACILITY (SF)**

**FAC: 7311**

**BFR Required: N**

73012-1 **DEFINITION.** Category Code 730 12 is provided for inventory purposes only in cases where these facilities are provided in a separate building or structure. For new facility planning purposes, this requirement shall be included as part of the Fire Station, Code 730 10.

### **730 13 ISSUE/RETAIL CLOTHING AND UNIFORM CENTER (SF)**

**FAC: 7343**

**BFR Required: N**

73013-1 **DEFINITION.** This is a retail outlet for military clothing and accessories. This facility is operated by the Navy and Marine Corps Exchange Service. It is integrated with the Exchange Retail Store, CCN 740-01 at most existing and all new stores. This category code is provided for inventory purposes only.

**730 15 BRIG (SF)****FAC: 7312****BFR Required: Y**

Design Criteria: For Renovations, refer to MIL-HDBK-1037/4.  
For New Construction, refer to the American Correctional Facilities Guidelines.

73015-1 **DEFINITION.** This code is to be used for facilities whose primary purpose is the confinement of personnel. A facility with confinement as a secondary use should be coded according to its primary use. For example, a restricted barracks is coded as a facility in the appropriate code of the 721 group.

73015-2 **REQUIREMENTS.** Requirements for brigs may only be established at activities where such facility is authorized by SECNAV. This insures strategic distribution of the facilities. Where planning for a brig is authorized, space allowances are in accordance with Table 73015-1 and Table 73015-2. The prisoner capacity is 0.5% of the total military strength in the area served by the facility. This figure may be adjusted by the Bureau of Naval Personnel to compensate for local variations in projected prisoner population. The adjusted figures are available from the Bureau of Naval Personnel (PERS-84).

Where facilities are to include space for gainful employment, they will be programmed on the basis of identified equipment requirements but not to exceed 7 m<sup>2</sup> (75 gsf) per prisoner.

73015-3 **APPROVAL PROCESS.** A request for approval of the establishment of a brig as a Navy place of confinement shall be submitted to the Secretary of the Navy via the chain of command and the Bureau of Naval Personnel or Commandant of the Marine Corps, as appropriate.

73015-4 **SPACE ALLOWANCES.** The gross area allowances shown include facilities for housing, training, welfare, administration, and recreation. The space for prisoner berthing in dormitories must have a minimum of 7 m<sup>2</sup> (72 ft<sup>2</sup>) net sleeping area per prisoner. All cells should be planned for single occupancy and be of 6' x 8' x 8' minimum dimensions.

**Table 73015-1. Space Allowances for Correctional Centers**

Capacity	Gross Area Per Prisoner	
	sq. m	SF
Up to 25	51	550
50	41	440
150	33	350
250	31	330
400	28	300

73015-5 **SITING.** The brig shall be sited where it is free from safety hazards due to its extended evacuation time. The size of site and its location in relation to other activity facilities shall be agreed between the using activity and PERS-84.

73015-6 **FUNCTION.** The structure and its functional components shall be planned in accordance with the guidelines contained in SECNAVINST 1640.9B (Dec '96 @ <http://neds.nebt.daps.mil/1640.htm>), the American Correctional Facilities Guidelines (new construction) and MIL-HDBK 1037/4 (renovation).

The following list and Table 73015-2 highlight the components which normally should be considered when planning for a brig. The list is not intended to be all inclusive nor may all components be required at all locations. It should be used only for guidance or as a checklist. Figures shown on Table 73015-2 are net square meter (net square feet) and are intended to be utilized for planning physical layout. The size of the spaces may vary depending on the particular needs of the activity.

73015-6.1 **Administrative Section.** Admin. section; Brig Officer's office; prisoner, visitor and legal visiting rooms.

73015-6.2 **Prisoner Processing.** Receiving and release room; prisoner storage; holding cell.

73015-6.3 **Medical Exam Spaces.** Doctor, Dentist and Psychiatrist.

73015-6.4 **Dining Facilities.** Brigs with 100 prisoners or less should cater food from existing base facilities where practical; Brigs over 100 prisoners use cat. code 722-10 criteria.

73015-6.5 **Prisoners Quarters.** Cells or secure rooms will have single occupancy 6'x8'x8' minimum dimension and the total number shall not exceed 15% of prisoner capacity. Dormitories will berth 85% of prison capacity; maximum 35 prisoners per dormitory and 7 sq.m. (72 SF) net sleeping area per prisoner.

73015-6.6 **Other Miscellaneous Spaces as Required.** Staff lounge, classrooms, vocational shop, laundry, chapel counseling, library and recreation facilities should be planned based upon local needs.

**Table 73015-2.  
Brig Capacity Number of Prisoners**

Type of Space	U/M	50	100	150	200	250	300
Administrative Section	sq. m	151	251	251	269	288	288
	SF	1620	2700	2700	2900	3100	3100
Prisoner Processing	sq. m	67	82	82	93	93	93
	SF	720	880	880	1000	1000	1000
Control Room	sq. m	13	13	13	13	22	22
	SF	140	140	140	140	240	240
Barber Shop	sq. m	17	22	22	22	22	22
	SF	180	240	240	240	240	240
Library	sq. m	19	37	37	74	74	74
	SF	200	400	400	800	800	800
Medical Exam Room	sq. m	17	28	28	28	39	39
	SF	180	300	300	300	420	420
Staff Lounge w. Toilet	sq. m	20	42	42	42	42	42
	SF	220	450	450	450	450	450
Chapel, Auxiliary Multipurpose Classroom, Magistrate	sq. m	46	93	93	139	139	186
	SF	500	1000	1000	1500	1500	2000
Special Quarters and Security Cell (6' x 8' x 2') 1830 x 2440 x 610 mm	EA	8	12	16	22	26	32
Segregation Cell (6' x 8' x 8') 1830 x 2440 x 2440 mm	EA	2	4	6	8	10	12
Mail Office	sq. m	11	11	22	22	33	33
	SF	120	120	240	240	360	360
Counselor's Office Supervisor's Training	Sq. m	26	39	46	46	52	52
	SF	280	420	490	490	560	560
Exchange	Sq. m	11	11	22	22	33	33
	SF	120	120	240	240	360	360
Recreational Equipment Storage	SF	140	140	140	240	240	240

**730 20 SECURITY BUILDING (SF)****FAC: 7313****BFR Required: Y**

73020-1 **DEFINITION.** A security building housing the shore patrol and military or civilian police forces may vary in use from a standard police station to a large security department. Security buildings are generally located well within the base perimeter, and not adjacent to gatehouses.

73020-2 **STANDARD POLICE STATIONS.** For a police force limited to law enforcement within an installation, with no detention responsibilities, plan on the basis of 5 sq.m. (50 SF) per person employed at the police station. This includes the total of all persons in administrative functions and on patrols, for all shifts.

73020-2.1 The space allowance provides space for all or part of the following: armory; administration; communication; fingerprint room, file space; storage; training and briefing; dayroom; maintenance of official vehicles; miscellaneous related support.

73020-3 **LARGE SECURITY DEPARTMENTS.** For large security departments providing a variety of services, including combined dispatch centers with fire and medical services, individual justification for space requirements is required. Spaces may include: administrative areas, waiting areas, customer service and report writing areas, dispatch centers including consolidated dispatch centers for medical, fire and security, armory, Pass and ID services, package inspection, ready issue communication equipment storage, general supply, and break lounges.

**730 21 DEFENSIVE FIGHTING POSITION (SF)****FAC: 1498****BFR Required: Y**

73021-1 **DEFINITION** A Defensive Fighting Position (DFP) is an elevated facility that houses operations responsible for the protection of access and/or egress to designated areas or facilities and can serve an installation's security force or a tenant command requiring secure access within a dedicated area or compound. These are typically used at installation Entry Control Points (ECPs), at Pier Heads, and sometimes at secure areas within an installation. For landside DFP applications, the DFP must be located such that it is near the active vehicle barriers and provides the occupants the ability to oversee response zone traffic and operations at the ID check area. For waterside DFP applications, the DFP must be positioned along the waterfront (typically at the head of the pier) to allow 360 degree observation and employment of both non-lethal and lethal force. The DFP will be utilized as an elevated fighting position and as

such will be equipped with gun ports to allow the occupants to respond to threats. The gun ports should be positioned to cover the likely avenues of approach and be constructed to accommodate depression angle requirements of weapons (lethal and non-lethal) employed therein. Objectively, the DFP should facilitate weapons employment throughout the entire threat zone as defined by NTTP 3-07.2.1 and as established in installation Antiterrorism Plan.

Note: Landside DFPs should have a 360 degree field of view but geographic constraints/restraints may preclude this at some locations.

## 73021-2 REQUIREMENTS

73021-2.1 DFPs must provide adequate space within the overwatch for movement of a guard and the use of handguns, shoulder fired weapons, and select non-lethal weapons systems. Gun/weapons ports shall be provided on each face of the overwatch (providing a 360 degree field of view). Note: Gun/weapons ports may not be required on all sides of the DFP if the protection plan into which these positions are being placed accommodates/establishes 360 degree protection to assets contained therein.

73021-2.2 The DFP overwatch shall consist of a 36GSF (maximum) structure as in figure 73021-1.

73021-3 The requirements calculation process should begin with consultation with the installation SECO (Security Officer) and ATO (Antiterrorism Officer) to determine how many DFP overwatch positions are needed. For locations within an installation where a tenant command requires a DFP for a dedicated secure area or compound, coordination with the command's OIC may be necessary to obtain requirements.

For the purposes of the BFR, all DFP requirements serving an installation's security force can be captured within a single BFR and based on the installation UIC. If the requirement is for a tenant command for a dedicated secure area or compound within an installation, the BFR should be captured using the tenant command UIC and should be exclusive of the installation's requirements.

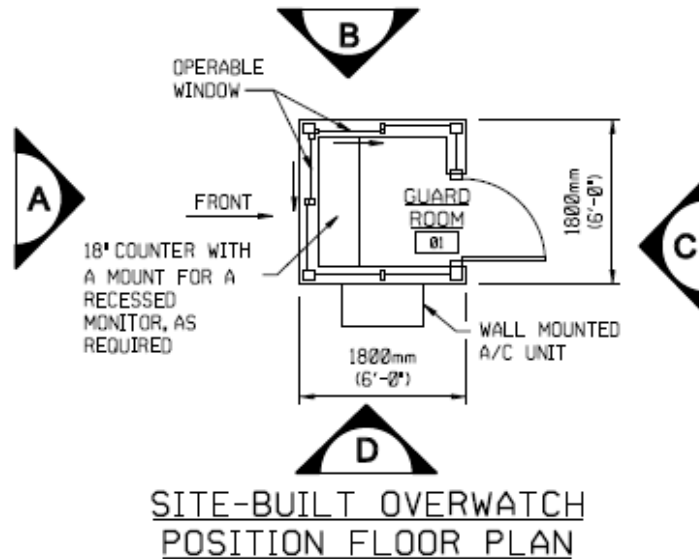
For the purposes of identifying assets in INFADS, use individual property record cards (PRCs) to capture the DFP assets for each landside and waterfront entry control point (ECP) and capture them using the installation UIC. Note their locations on the PRC. If the asset(s) is/are for a specific tenant command for their own secure area(s) or compound(s), use the tenant command UIC to capture all DFPs associated with the command. For the purposes of Asset Evaluations (AEs), if an existing facility is not elevated, note that it is deficient with respect to its functional or space criteria for a building or structure.

Below is a notional diagram of a typical DFP layout. Note that these facilities are typically elevated towers with occupied space on upper floor(s) and an interior



stairwell below. The area below the occupied space(s) is not counted as useable area on the property record card.

**Figure 73021-1 Model Defensive Fighting Position**



**73021-4 SITING CRITERIA.** Several elements must be considered early on in locating the position of a DFP. It is **CRITICAL** that regional and installation Security Officers (SECO) and Antiterrorism Officers (ATO) be consulted early in the location process. Attention must be given to:

- Topography of the intended location and resulting field of fire.
- More than one may be necessary to adequately cover ECP field of view considerations and different avenues of approach.
- Safety of the occupant due to firing from gate guards.
- Safety of general public from downrange fire
- Weapon system to be utilized and its coverage capability.
- DFP should be located behind final denial barrier.
- DFP Should be located a sufficient distance from ECP to allow time for operation of final denial barrier.
- Waterfront DFPs should be positioned in such a manner to allow for overlapping fields of fire. Objectively, there should be sufficient fields of fire established (i.e. sufficient number of DFPs) that the elimination of any single DFP does not preclude the other DFPs from employing force (lethal/non-lethal) across the entire waterfront. The exact number of DFPs required should be delineated in the installation Antiterrorism plan and/or defined by coverage factor requirements of higher headquarters or both. The number of DFPs required along the waterfront can and should also be influenced by the types/capabilities of weapons (lethal/non-lethal) planned to be employed from therein.

Note: As the urban environment has migrated to the borders of military installations, military operations are being conducted in closer proximity to the general public. Installation public works, security and antiterrorism teams must factor the proximity of the general public into the protective designs of DFPs. Installations shall consider incorporation/application of protective elements such as retaining walls (walls to absorb bullets) into the DFP design (landside application).

73021-5 **USE OF RE-LOCATABLE BUILDINGS** See OPNAVINST 11010.33C for guidance on the use of re-locatable facilities as DFPs. Make-shift facilities created from items such as concrete barricades, box culverts, and similar items are not to be captured as real property DFPs in iNFADS.

## 730 22 NCIS FIELD OFFICE (SF)

**FAC: 7313**

**BFR Required: Y**

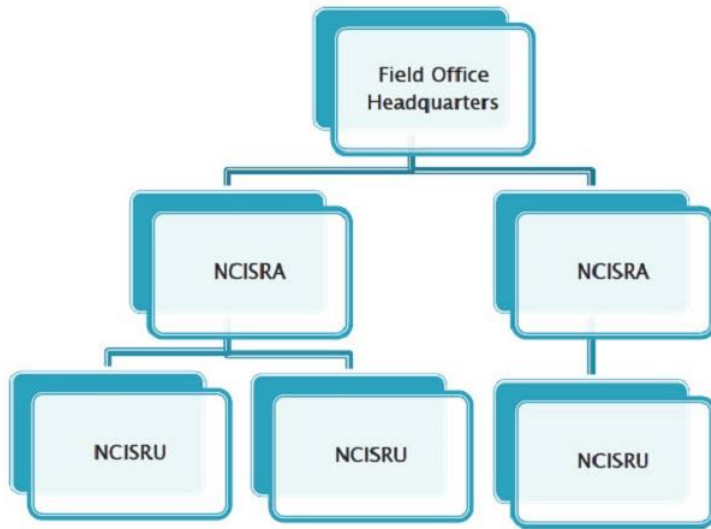
73022-1 **Definition.** A building that houses the command, operation, and administrative functions assigned to the U.S. Naval Criminal Investigative Service (NCIS). NCIS is the primary law enforcement agency of the U.S. Department of the Navy. Its primary functions are to investigate criminal activities involving the U.S. Navy and U.S. Marine Corps, though its broad mandate includes national security, counterintelligence, counterterrorism, cyber warfare, and the protection of U.S. naval assets worldwide. The criteria specifically address NCIS Field Offices, NCIS Resident Activities, NCIS Resident Units and various mission specific components.

73022-2 **Planning Factors.** Review the criteria contained herein and use this information in tandem with the NCIS BFR Template to develop space requirements for NCIS organizations.

### Notional Organizational Chart and Staffing Levels

#### NCIS Field Office (NCISFO)

- Special Agent in Charge (SAC)
- Assistant SACs (ASACs) (Crim, CI)
- Senior Intelligence Officer (SIO)
- Field Operations Support Officer (FOSO)
- Supervisory Program Analyst (SPA)
- Field Computer Specialist (FCS)
- Investigator(s) (1801)
- Intelligence Analyst (s)
- Program Support Assistants (PSAs)



**NCIS Resident Agency (NCISRA)**

- Can be collocated or geographically separated from field office HQ
- Supervisory Special Agent(s) (SSA)
- Special Agents (SAs)
- PSA(s)

**NCIS Resident Unit (NCISRU)**

- Geographically separated from NCISRA
- One or more SAs

NCIS Field Office (NCISFO)	25-50 personnel
NCIS Resident Agency (NCISRA)	13-20 personnel
NCIS Resident Unit (NCISRU)	1-5 personnel

73022-3 **Personnel Loading.** Personnel loading must be supported by an official personnel-loading report. See CCN 61010, Sections 61010-3 and 61010-4 for additional information.

73022-4 **NCIS BFR Template**

When preparing a BFR for NCIS, contact and coordinate with the NCIS Engineering Office at the following email address:

[NCIS\\_Code\\_11A\\_Engineering@NCIS.NAVY.MIL](mailto:NCIS_Code_11A_Engineering@NCIS.NAVY.MIL).

Two levels of approval are required to certify BFR.

1. Mission Approver (NCIS)
2. Activity/PWD Approver (NAVFAC)

The NCIS Engineering Office serves as the “Mission Approver” for all NCIS BFRs. The local installation serves as the “Activity/PWD Approver.”

73022-5 **General Administrative Space**

For Private Office, Open Office, Flex Office and associated Circulation Space, see CCN 61010, Table 61010-5.1. Telework Design criteria is not applied for NCIS entities.

## 73022-6 **Basic Allowances**

For Admin Support, Break Room and Conference/Training Space, see CCN 61010, Table 61010-7.1.

Note: CCN 61010, Table 61010-7.1A. Conference/Training Room Table provides an overall Conference/Training Room space allocation. For example, if an organization has 112 personnel, an overall conference/training room allocation of 750 NSF is allocated. This overall allocation of 750 NSF can be broken down in any way that best suits the organization, for example it could consist of five conference rooms at 150 NSF each or any variation amounting to 750 NSF. This allocation includes collaboration spaces, teaming rooms, etc.

## 73022-7 **Functional Support**

73022-7.1 **Case File Storage:** See CCN 61010, Table 61010-7.2 for Archive Storage

Planning Factor: Allocate NSF based on a space analysis

Justification Guidelines: Approved for FO, RA and RU. All require on-site case file storage of active and on-going investigations. NCIS Case Files are "permanent records" as defined by SECNAV M-5210.1 - DON RECORDS MANAGEMENT PROGRAM. A space analysis is required. Multiply the total number of filing cabinets and safes by a planning factor of 7 NSF/EA.

73022-7.2 **Grand Jury Room:** A Grand Jury Room serves as a meeting room for review of ongoing court cases and provides storage room for active litigation documents. Although this space is similar to a conference room, it is additional to the basic conference/training room allocation. This space may require locks or key card entry, but is not necessarily a secure (classified) space.

Planning Factor: Allocate one Grand Jury Room at 150 NSF

Justification Guidelines: Justified for FO if economic crimes component is present. Approved for RA. Not approved for RU.

73022-7.3 **Graphic Workstation:** Shared computer workstation space(s) used to recreate crime scenes, sketch suspects, and develop media presentations. Each workstation requires one NMCI drop and one commercial drop. The purpose of the commercial drop is for the investigation of online evidence that would otherwise be blocked by NMCI, for example, a suspect's social media. This room is not intended to be the primary workspace for any staff. The number of graphic workstations shall be based on regional requirements as determined by the NCIS Engineering Office.

Planning Factor: Allocate up to four workstations at 64 NSF/WS

Justification Guidelines: Not approved for FO. Approved for RA and RU. Number of graphic workstation(s) based on discussion with NCIS Engineering Office.

73022-7.4 **IT Equipment Storage:** Storage for computer and telecommunication equipment for the using organization. This space type is based on the total number of personnel.

Planning Factor: Allocate 5 NSF/PN, minimum size is 60 NSF

Justification Guidelines: Approved for FO, RA and RU.

73022-7.5 **IT Logistic Support Storage:** A dedicated shipping, receiving, laydown/IT staging, and storage area may be provided to support the IT equipment and parts storage for a NCISFO and that of component NCISRAs and/or NCISRUs. This area is in addition to any maintenance parts and consumables storage requirements that may also exist. The need for IT Logistic Storage Space shall be based on regional requirements as determined by the NCIS Engineering Office.

Planning Factor: See FC 2-000-05N, 131 Series Introduction, Section 131-13.

Justification Guidelines: Justified for FO based on regional requirements. Space analysis is required. Not approved for RA or RU.

73022-7.6 **MCRT Gear Storage:** Provides storage to support a Major Case Response Team's (MCRT) gear storage for special agents. Gear is stored primarily within pelican cases on shelves. Pelican cases are molded plastic containers that seal with an airtight and watertight gasket. Pelican cases for MCRT gear may include but are not limited to: crime scene kits for blood spatter analysis, digital and still camera kits, evidence collection kits, lighting kits for crime scenes and ultra-violet lighting kits for detection of different substances. This space type is based on the number of special agents (SA).

Planning Factor: Allocate 10 NSF/SA, minimum size is 100 NSF

Justification Guidelines: Approved for FO, RA and RU.

73022-7.7 **Secure Conference Room:** Provides space for classified meetings and briefings. This space allocation is in addition to the basic conference/training room allocation above.

Planning Factor:

- Allocate NCISFO secure conference room at 200 NSF
- Allocate NCISRA secure conference room at 120 NSF
- Allocate NCISRU secure conference room at 100 NSF
- Allocate OTHER secure conference room at 120 NSF

Justification Guidelines: Most NCIS organizations operate in secure facilities and have access to secure conference rooms and therefore do not require this space type. If an NCIS organization's primary facility is not secure and only intermittent access to classified briefings are required, a secure conference room is justified.

- Not approved for FO. For FO, apply Mini-MTAC allocation below rather than the secure conference room allocation. The Mini-MTAC is an unmanned, secure space and can also serve as a secure conference room. Ensure that secure conference room and Mini-MTAC are not both allocated at the field office level.
- Justified for NCISRA when only intermittent access to a secure conference room is required. For example, CRIM Agents typically work in an unclassified environment because they require access to their cell phones and require only intermittent access to a secure conference room.
- Approved for NCISRU. NCISRUs are so small (1-5 persons) that they are not authorized a conference room space allocation. However, even if a NCISRU consists of one person, that person must still be able to host a meeting and therefore a basic secure conference room allocation of 100 NSF is approved. Note that at the NCISRU level, the conference room does not necessarily have to be "secure", it can be an ordinary conference room.

### 73022-7.8 **Secure Terminals**

Secure Terminals (not shown in figure above) provide a secure area for handling classified material. This space type is not intended to be the primary workspace for any staff. The number of workstations required must be provided by the organization's Security Officer.

Planning Factor: Allocate 64 NSF per workstation

Justification Guidelines: Justified for FO, RA, and RU.

**73022-8 Evidence Storage**

Note: In rare circumstances, an exception to the justification guidelines may be required for evidence storage space types due to site constraints or regional requirements. The NCIS Engineering Office shall provide rationale and responsibility for such an exception in writing.

**73022-8.1 Bulk Evidence Processing:** Room used to process large items of evidence such as, couches, mattresses, washing machines, etc. This space type is based on the number of special agents (SA).

Planning Factor: Allocate 10 NSF/SA, minimum size is 100 NSF

Justification Guidelines: Approved for FO. Justified for RA if drive-time to FO is greater than 60 minutes.

**73022-8.2 Evidence Custodian Station:** Space is required for an evidence custodian station to control and monitor entry to the long-term evidence storage. This overall space is based on a dedicated workstation area of 144 NSF. Since the person manning this space is already accounted for within the General Admin Space allocations at 64 NSF for an open office, this space type is reduced to 80 NSF.

Planning Factor: Allocate one evidence custodian station at 80 NSF

Justification Guidelines: Approved for FO. Justified for RA if drive-time to FO is greater than 60 minutes.

**73022-8.3 Evidence Preparation Area:** This space is used by special agents to prepare evidence for long-term evidence storage.

Planning Factor: Allocate 3 NSF/SA, minimum size is 60 NSF

Justification Guidelines: Approved for FO. Justified for RA if drive-time to FO is greater than 60 minutes.

**73022-8.4 Long-Term Evidence Storage:** Long-term evidence storage is required for securely storing evidence related to ongoing investigations. Space is required primarily for evidence storage shelves and secure storage lockers. A refrigerator is required for the storage of biological evidence. A separate, more secure area is required for storage of firearms, narcotics, currency and/or high-value items. This space type is based on the number of special agents (SA).

Planning Factor: Allocate long-term evidence storage at 30 NSF/SA

Justification Guidelines: Approved for FO. Justified for RA if drive-time to FO is greater than 60 minutes.

**73022-8.5 Temporary Evidence Storage:** This space is for temporary storage of items, awaiting transfer to a long-term, secure evidence storage facility, typically located at nearest NCISFO or NCISRA. Space is required for packaging materials, personal protective equipment, an eyewash station, and a refrigerator for the storage of biological evidence. This space type is based on the number of special agents (SA).

Planning Factor: Allocate temporary evidence storage at 12 NSF/SA

Justification Guidelines: Not approved at FO. Justified for RA if not collocated with FO. Approved for RU.

#### **73022-9 Fitness**

**73022-9.1 Self Defense Training:** A semi-private room or enclosed area for self-defense training. At a minimum, this space includes easy-to-clean mats that will handle the impact of self-defense training. This space type is based on the number of special agents (SA). A minimum of 10 agents are required to justify this space type.

Planning Factor:

- Allocate 128 NSF for 10-29 special agents
- Allocate 256 NSF for 30 or more special agents

Justification Guidelines: Approved for FO, RA and RU. For security purposes, self-defense training is conducted within NCIS facilities as opposed to a local Installation Fitness Center. A minimum of 10 special agents are required to approve/authorize this space type.

**73022-9.2 Locker Room:** A locker room provides temporary storage lockers for a change in clothing and other personal belongings. This space type is required within NCIS facilities in support of agents working active crime scenes. This space type is based on the number of special agents (SA).

Planning Factor: Allocate one locker at 8 NSF each for every two special agents

Justification Guidelines:

Approved for FO, RA and RU. Agents must be able to shower after conducting a crime scene analysis and therefore require a locker.



73022-9.3 **Shower Room:** A shower room provides one or more shower stalls and is typically collocated with a bathroom and/or locker room. This space type is required within NCIS facilities in support of agents working active crime scenes and self-defense training.

Planning Factor: Allocate one shower at 20 NSF each for every 10 special agents

Justification Guidelines: Approved for FO, RA and RU. While locker and shower rooms do support NCIS Fitness and Self Defense Training functions, the primary requirement for lockers and showers is so agents are able to wash any blood, saliva or unknown substances off their skin with soap and lots of running water after working an active crime scene. A minimum of 10 special agents are required to approve/authorize this space type.

## 73022-10 **Interviews**

73022-10.1 **Booking & Fingerprinting:** Space used for processing, photographing, and fingerprinting individuals arrested, charged or accused of a crime. This space type is based on the number of special agents (SA).

Planning Factor: Allocate 3 NSF/SA, minimum size is 60 NSF

Justification Guidelines: Approved for FO, RA and RU.

73022-10.2 **Hard Interview Room:** Room used to interview a suspect or criminal. The number of hard interview rooms shall be based on regional requirements as determined by the NCIS Engineering Office.

Planning Factor: Allocate one hard interview room at 100 NSF each

Justification Guidelines: Approved for FO, RA and RU. Hard interview rooms are allocated based on regional requirements.

73022-10.3 **Soft Interview Room:** Room used to interview a victim. Unlike a hard interview room, this space may include comfortable chairs, wall decorations and soft lighting, meant to make victims of traumatic crimes feel more comfortable sharing crime details with investigators. The number of soft interview rooms shall be based on regional requirements as determined by the NCIS Engineering Office.

Planning Factor: Allocate soft interview room at 120 NSF each

Justification Guidelines: Approved for FO, RA and RU. Soft interview rooms are allocated based on regional requirements.

73022-10.4 **Observation Room:** An Interview Observation Room is located between hard interview rooms. One-way glass windows share common walls with the hard interview rooms for monitoring interviews. Consideration should be given to using CCTV feeds rather than providing space for an observation room.

Planning Factor: Allocate one interview observation room at 100 NSF each

Justification Guidelines: Approved for FO, RA and RU. Interview observation rooms are allocated on a case-by-case basis.

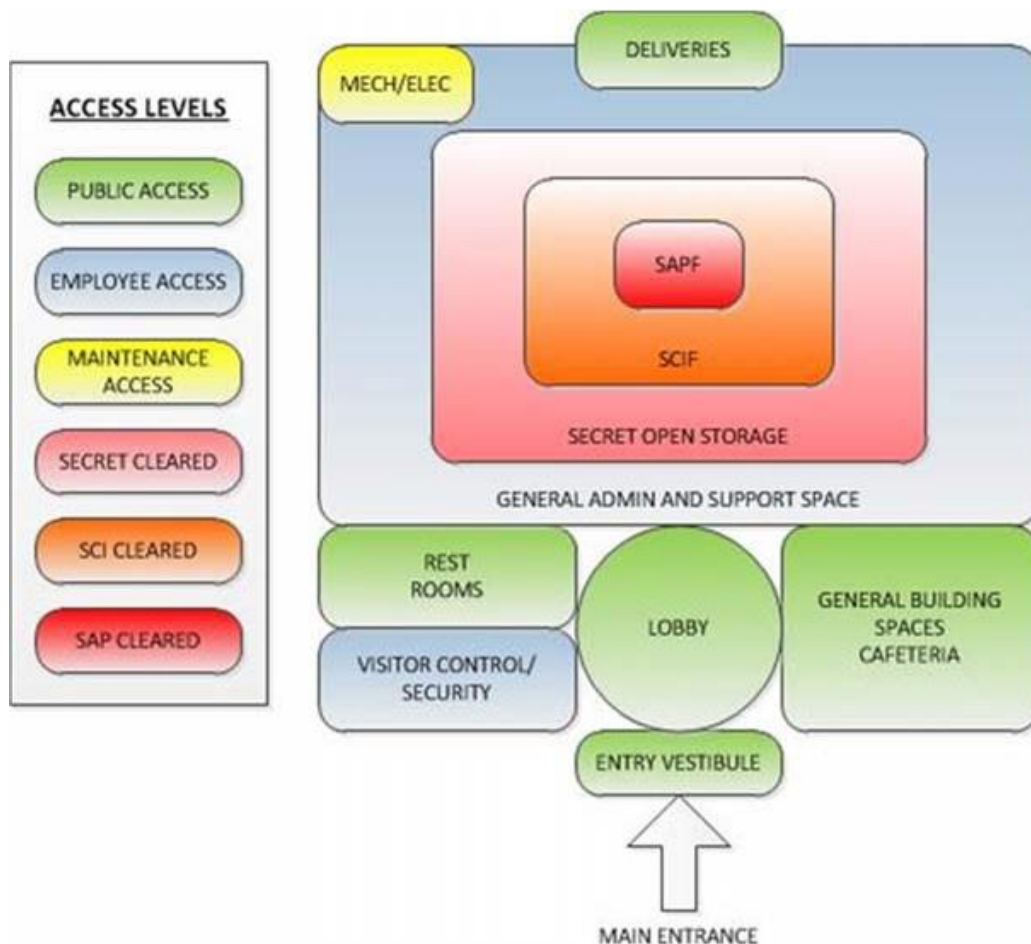
#### 73022-11 **Secure Areas**

These space types are discussed here in general, but are not included in the NCIS BFR Template.

Depending on the mission of an organization, some secure areas may be required, ranging from secure kiosk stations, to Open Secret Storage (OSS) areas, to a Sensitive Compartmented Information Facility (SCIF), to a Special Access Program Facility (SAPF). If a portion of an organization operates at a higher classification than the rest of the facility, the space provided for them is calculated based on the overall requirements set forth in the 131 Series Introduction criteria.

Do not call-out the classification levels of space types in planning or design documents. Refer to these spaces only as “secure spaces”. For NCIS, these space types typically consist of an office space environment with dedicated office spaces. This means the secure spaces do not have to be called out specifically in the BFR, because they have already been accounted for in the office space requirements. This also supports the OPSEC goal of not identifying the level of secure area or the mission in planning or design documents.

### Notional Diagram of Secure Space Types



In some cases, one or more analysis workstations may be required and must be called out separately as an “analysis workstation”.

- For analysts working in a secure environment:
  - Allocate 90 NSF for an analysis workstation required to monitor up to 4 networks.
  - Allocate 130 NSF for an analysis workstation required to monitor more than 4 networks.
- If using the NCIS BFR Template, an analysis workstation can be included as a “user-defined-space”.
- If using the NCIS BFR Template, ancillary secure comms spaces, can also be included as “user-defined-spaces”.

73022-12 **Security**

See Table 61010-7.3 for Entry Control Area, Secure Visitor Waiting Area and Weapons Vestibule and Vault.

73022-13 **Watch Center**

73022-13.1 **Mini-MTAC:** The Multiple Threat Alert Center (MTAC) for NCIS Headquarters is a large Watch Center utilizing NCIS' worldwide presence and combination of law enforcement, counter intelligence, intelligence, and security capabilities to identify a wide range of threats to Navy and Marine Corps personnel and assets around the world.

A true Watch Center generally operates on a shift system where personnel oversee multiple systems using multiple shifts to provide coverage up to 24 hours a day. A Watch Center may include the following areas based on mission requirements: Watch Floor (containing Kiosk Workstations, Watch Stander Workstations, and Watch Workstations). Workspaces require an unobstructed view in order to see a centralized display area on a room wall consisting of multiple flat panel screens.

NCIS Field Offices may require portions of a Watch Center in the form of a Mini-MTAC<sup>1</sup>. This is a secure space, but is not permanently manned. At the Field office level, this space type is the equivalent of a secure conference room.

Planning Factor: Allocate Mini-MTAC area at 200 NSF

Justification Guidelines: FO requires portions of a Watch Center in the form of a scaled-down "Multiple Threat Alert Center" (MTAC) referred to here as a "Mini-MTAC". This is a secure space. At the field office level, this space type is the equivalent of a secure conference room, 200 NSF in size. Do not apply secure conference room allocation above, if allocating space for a Mini-MTAC here.

73022-13.2 **Server Room:** A server room is an air-conditioned space, devoted to the continuous operation of computer servers. An entire building or station devoted to this purpose is a data center. For Server Rooms with less than 120 racks, the recommended server room requirements are listed in Table 131-6. For a server room with less than 10 racks, multiply the total number of racks by 45 NSF/Rack.

Planning Factor: See Table 131-6 Equipment Room Requirement by Total Racks and Table 131-7. C5ISR Equipment Factor.

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<sup>1</sup> The Multiple Threat Alert Center (MTAC) for NCIS Headquarters is a large Watch Center. It is a unique platform in that it merges intelligence from other agencies with information from NCIS source networks and law enforcement activities worldwide to provide the most relevant operational support to Navy and Marine Corps commanders.

Justification Guidelines: FO, RA and RU all may require a secure server room. This space type is intended for NCIS operated servers and does not apply to NMCI operated servers.

***Mission Specific Components:***

In addition to the NCIS Field Office space requirements identified above, some field offices have specialized component missions and require unique space types.

Specialized component missions include:

- Cyber Operations
- Economic Crimes (formerly known as Fraud)
- Forensics Support
- Polygraph Services
- Protective Operations
- Security Training Assistance and Assessment Team (STAAT)
- Technical Services and Technical Surveillance Countermeasures
- Virtual Operations

73022-14    **Cyber Operations**

Cyber Operations conduct cyber investigations, proactive cyber operations, and cyber forensics support for the Department of the Navy (DON). NCIS cyber capabilities disrupt, deter and defend against criminal, terrorist, and foreign intelligence threats against the DON. NCIS Cyber Operations provides full-spectrum criminal, counterintelligence, counterterrorism investigations and operations in the cyber domain; conducts cyber forensics and analysis; coordinates and partners with law enforcement and intelligence in the U.S. and abroad; capitalizes on data by identifying existing and emerging threats to predict future trends and enhance capabilities; collaborates with industry, academia and mission partners.

Unique space types associated with Cyber Operations include:

73022-14.1    **Cyber Forensics Lab:** A shared, unclassified area NCIS agents use to analyze evidence such as recovered cell phones, laptops, desktops, and other electronic storage. This area is unclassified because it may contain cell phones and other unsecured electronic devices.

Planning Factor:    Allocate one cyber forensics lab at 300 NSF

Justification Guidelines:    Approved if NCISFO has a cyber-operations component.

73022-14.2 **Hard Drive Recovery Room:** A dedicated clean room used to recover data from a hard drive that may have been corrupted, lost or damaged. This space type is designed to avoid particles and contaminants that can settle on sensitive exposed hard drive components as this may affect the recovery process and cause a malfunction or permanent loss of data.

Planning Factor: Allocate one hard drive recovery room at 100 NSF

Justification Guidelines: Approved if NCISFO has a cyber-operations component.

## 73022-15 **Economic Crimes**

Economic Crimes safeguards DON acquisition programs and enhances fleet readiness and superiority by conducting investigations and proactive operations to identify and reduce economic crimes. Economic Crimes priorities are to identify and reduce product substitution threatening warfighter safety and battlefield superiority, to combat corruption in the acquisition process, and to ensure protection of Navy capital investment in technology. By reducing procurement fraud, defined as bribery, subcontractor kickbacks, conflict of interest, cost mischarging, and product substitution, the DON will realize cost savings and procure products that meet safety standards for the warfighter, ultimately resulting in increased operational readiness.

Unique space types associated with Economic Crimes include:

73022-15.1 **Grand Jury Room:** This space type is defined in the “Special Purpose Space - Functional Support” section above.

Justification Guidelines: Approved if NCISFO has an economic crimes component.

## 73022-16 **Forensics Support**

Forensics Support provides forensic crime scene support to DON investigations. The Office of Forensic Support is a team of specially trained forensic consultants that assist in the processing of crime scenes. Although all NCIS Special Agents receive basic forensic training, these consultants are experts in crime-scene reconstruction, firearms trajectory, blood spatter analysis, and human remains recovery and examination. Their input is critical to a range of investigations, from deaths to economic crimes and even counterintelligence. Unique space types associated with Forensics Support include:

73022-16.1 **Forensics Lab:** Space used to collect samples and process evidence for further evaluation, including fingerprint analysis, evidence analysis and photography.

This space includes a workstation for a forensic consultant, evidence refrigerator, secure evidence cabinet, sink, standing lab bench, work counters, and fuming/drying chambers. Forensic Support personnel use this space.

Planning Factor: Allocate one forensics lab at 20 NSF/SA

Justification Guidelines: Approved if NCISFO has a forensics support component.

**73022-16.2 Low-Bay Garage:** Space used to collect forensics data (residues, blood, fluids, finger prints, tire prints, bullet trajectories, ID of auto parts and paints). Space is required to accommodate a large SUV or van. A vehicle lift is not required; therefore, this space is not "high-bay". Space must provide sufficient space between the roof of vehicle and room ceiling for inspection, so this space would not include a dropped ceiling. Allocate up to two vehicles (VE) requiring simultaneous storage based on interview with using activity.

Planning Factor: Allocate up to two vehicles at 375 NSF/VE

Justification Guidelines: Approved if NCISFO has a forensics support component.

**73022-16.3 Vehicle Evidence Parking Area:** A fenced and dedicated parking area for storing evidentiary impounded vehicles. This space requirement is included here for information purposes only. This asset and space requirement are recorded under CCN 85210 - PARKING AREA. The number of vehicles (VE) requiring simultaneous storage is provided by the using activity.

Planning Factor: Allocate one vehicle evidence parking area at 35 SY/VE

Justification Guidelines: Approved if NCISFO has a forensics support component.

### **73022-17 Polygraph Services**

Polygraph Services is comprised of highly skilled interviewers who utilize the polygraph to obtain information in support of criminal, counterintelligence, and counterterrorism investigations for NCIS, the Department of the Navy, and the Department of Defense. Additionally, the Polygraph Services Division performs pre-employment polygraphs and administers the DON's Counterintelligence Scope Polygraph Program, helping to ensure that the DON's most sensitive national security programs are protected against the "insider threat."

Unique space types associated with Polygraph Services include:

**73022-17.1 Polygraph Exam Room:** Room used to conduct exams that measures and records physiological indicators while answering a series of questions asked by the Examiner. While the physical requirements are similar to an "Interview Room", Polygraph Exam Rooms require specialized equipment that would not be found in an

Interview Room; therefore, these spaces cannot be shared as a dual-purpose space. The number of polygraph exam rooms shall be based on regional requirements as determined by the NCIS Engineering Office.

Planning Factor: Allocate one polygraph exam room at 120 NSF each

Justification Guidelines: Approved for NCISFO or NCISRA. Justified at a NCISRU on a case by case basis.

73022-17.2 **Observation Room:** A observation room is for monitoring polygraph exams. Located adjacent to one or more polygraph exam rooms, it provides sufficient space for a small table, two chairs, and audio/visual equipment. Consideration should be given to using CCTV feeds rather than providing space for an observation room.

Planning Factor: Allocate one polygraph observation room at 100 NSF each

Justification Guidelines: Approved for NCISFO or NCISRA. Justified at a NCISRU on a case by case basis.

#### 73022-18 **Protective Operations**

Protective Operations provides and manages full-time protection details on key Department of the Navy personnel. Protective Operations' mission is to prevent terrorist and/or criminal attacks on principals under NCIS executive protection coverage and execute the necessary and appropriate response to a threat and/or attack on a principal. Protective Operations supports DOD/DON High Risk Billets with full or part-time personal security advisors. Protective Operations also provides executive protection to visiting foreign dignitaries and other DOD/USG officials as required by the foreign liaison offices and other DOD/USG agencies. To supplement operational forces, Protective Operations maintains an internal Protective Intelligence Unit to identify potential threats that could affect a principal, understand a principal's level of vulnerability to any given threat, and use available intelligence to mitigate threats and/or risk to a principal.

Unique space types associated with Protective Operations include:

73022-18.1 **(POFO) High Bay Garage:** Protective Operations requires a secure, climate-controlled, high-bay garage for storage of armored Government Owned Vehicles (GOVs). The GOVs are used to provide executive protection to Senior Leadership and visiting foreign dignitaries. Space is required for GOVs, maintenance, cleaning, minor repairs and retrofitting electronic equipment. A high-bay garage is necessary, as at least one vehicle lift is required. These GOVs are large, armored SUVs. The planning factor is based on number of GOVs required at any one time.

Planning Factor: Allocate up to eight vehicles at 375 NSF/VE



Justification Guidelines: Approved for protective operations detachments.

73022-18.2 **Duty/Bunk Room:** A Duty/Bunk Room is required when a mission requires continuous operations, 24 hours a day, 7 days a week. NCIS Protective Operations components meet these requirements. Note: This space type requires approval from the Installation Commanding Officer due to liability issues.

Planning factor: Allocate one duty/bunk room at 130 NSF

Justification Guidelines: Approved for protective operations detachments. Requires additional approval from the Installation Commanding Officer for liability purposes.

### 73022-19 **Security Training Assistance and Assessment Team (STAAT)**

NCIS Security Training Assistance and Assessment Teams (STAAT) support Navy and Marine Corps components by providing vulnerability assessments and on-site training and assistance to Naval activities worldwide (ashore and afloat) in various law enforcement, physical security, and antiterrorism disciplines. STAAT supervisors and staff work closely with Commanders to determine the level of required support to protect Navy personnel and assets. STAAT also provides support to selected foreign and domestic law enforcement agencies to enhance the protection of U.S. personnel and assets worldwide.

Unique space types associated with a Security Training Assistance and Assessment Team include:

73022-19.1 **Academic Classroom:** This space includes computer-based (laptop) training stations. In addition to STAAT LANT and STAAT PAC, this space type is approved for STAAT Detachments as well. Student loading is provided by the using activity.

Planning Factor: Allocate academic classroom space at 20 NSF/ST

Justification Guidelines: Approved only for STAAT organizations. Does not apply to FO, RA, or RU. In the "Select NCIS Region" dropdown list, select "STAAT" to locate STAAT organizations.

73022-19.2 **Student Lounge:** This space provides a student lounge area during training breaks or lunch. It typically includes some or all of the following: sitting tables, vending machines, microwave oven, and refrigerator.

Planning Factor: Allocate student lounge area at 4 NSF/ST

Justification Guidelines: Approved only for STAAT organizations. Does not apply to FO, RA, or RU. In the "Select NCIS Region" dropdown list, select "STAAT" to locate STAAT organizations.

## 73022-20 **Technical Services Division (TSD) and Technical Surveillance Countermeasures (TSCM)**

The Technical Services Division (TSD) provides DON technical support for criminal, counterintelligence, and counter-terrorism investigations and operations. Investigative Specialists provide specialized technical capabilities to support NCIS investigations and operations. The technical support provided by these highly trained specialists is often critical to the success of NCIS investigations and operations. Through their efforts, NCIS Special Agents and Technical Enforcement Officers are able to conduct authorized interception of telephone communications, employ covert video surveillance, and take advantage of other technical innovations to help meet mission requirements. Technical Services includes Technical Surveillance Countermeasures (TSCM).

Technical Surveillance Countermeasures (TSCM) protects DON classified information and critical infrastructure from being compromised by technical means. NCIS Technical Investigators are responsible for conducting the Navy's Technical Surveillance Countermeasures mission. They conduct investigations to protect the DON's classified information and critical infrastructure from being compromised by technical means (for example, through covert listening devices or other surveillance technology) employed by foreign intelligence or other parties. These NCIS professionals assess vulnerabilities and identify and resolve technical surveillance threats. NCIS Technical Investigators serve in TSCM units at NCIS Headquarters and select NCIS field offices around the world, where they are best positioned to meet the needs of the U.S. Navy commands, they support. TSCM detects, neutralizes, and exploits technical surveillance and associated devices, technologies, and hazards that facilitate the unauthorized or inadvertent access to, removal or theft of DOD information, via technical means at any worldwide facility, ship or aircraft.

Unique space types associated with TSD/TSCM include:

73022-20.1 **(TSCM) High Bay Garage:** This is a vehicle inspection garage, large enough to examine two vehicles the size of a large van or SUV. A high-bay garage is necessary, as at least one vehicle lift is required. This area is for bullet trajectory analysis, installation of GPS tracking equipment and other technical equipment. Technical Services personnel use this space.

Planning Factor: Allocate up to two vehicles at 375 NSF/VE

Justification Guidelines: Approved if NCISFO has a Technical Service or Technical Surveillance Countermeasures (TSCM) component.

73022-20.2 **Equipment Storage:** Large room with shelving for pelican cases used to store investigative and counter-intelligence equipment for TSCM. Pelican cases for TSCM equipment includes, but is not limited to: multiple types of radio frequency detection systems such as cellular or WIFI, portable x-ray systems to look inside a car or wall, network analysis tool sets, crime scene analysis tool sets and more.

This space is similar to the (MCRT) gear storage room used by agents; however, this equipment storage room is typically larger and is used by TSCM personnel. A space analysis is required.

Planning Factor: Allocate NSF based on a space analysis

Justification Guidelines: Approved if NCISFO has a Technical Service or Technical Surveillance Countermeasures (TSCM) component.

**73022-20.3 Equipment Testing & Evaluation Lab:** This space provides for testing and evaluation of field equipment prior to field operation. The space is equipped with a workbench, shelving, and test equipment. Technical Services personnel use this space. A space analysis is required.

Planning Factor: Allocate NSF based on inspection and testing room requirements

Justification Guidelines: Approved if NCISFO has a Technical Service or Technical Surveillance Countermeasures (TSCM) component.

**73022-20.4 Shop Space:** May include a wood shop, metal shop, and/or work benches. Technical Services personnel use this space. Shop Space requirements are developed by a space analysis using the allowances provided in Table 131-4 or an architectural layout. A space analysis is required.

Planning Factor: Allocate NSF based on a space analysis

Justification Guidelines: Approved if NCISFO has a Technical Service or Technical Surveillance Countermeasures (TSCM) component.

### **73022-21 Virtual Operations**

**Virtual Ops Center (VOC)** is a cyber-based operational counterintelligence platform to provide direct support to the DON by; protecting critical naval technologies and programs; conducting operations in the cyber domain; and protecting the DON's technological and warfighting advantage. The VOC's goal is to detect, identify, neutralize, and exploit attempts of foreign intelligence entities attempting to penetrate the DON and erode its warfighting edge.

Unique space types associated with a Virtual Operations Center include:

**73022-21.1 Virtual Operations Center:** A VOC is a highly specialized facility and may include the following space types: cyber labs with separate IT networks, SAP-F, SCIF, unclassified areas and a watch center. VOC space types must be aligned to either the 131 or 143 Series criteria. Space requirements need to account for the heavy electrical and mechanical loads and associated space requirements. Tier Level (I, II, III) for each function must be identified.

Planning Factor: Allocate NSF based on a space analysis

Justification Guidelines: Approved for NCISFO Virtual Operations Center (VOC).

**73022-21.2 Special Purpose Processing Node:** A Special Purpose Processing Node (SPPN) is a fixed data center or data servers in a fixed facility supporting special purpose functions that cannot or should not be supported by a DoD Core Data Center (CDC) or an Installation Processing Node (IPN) due to its association with mission specific infrastructure or equipment (e.g., Meteorology, Medical, Modeling & Simulation, Test Ranges, Classrooms, RDT&E, etc.). Source: [https://dodcio.defense.gov/Portals/0/Documents/DIEA/CDC%20RA%20v1\\_0\\_Final\\_Releaseable%20Version.pdf](https://dodcio.defense.gov/Portals/0/Documents/DIEA/CDC%20RA%20v1_0_Final_Releaseable%20Version.pdf)

Planning Factor: See Table 131-6 and Table 131-7.

Justification Guidelines: Approved for NCISFO Virtual Operations Center (VOC).

**73022-22 Net-To-Gross Factor**

The Net-To-Gross (NTG) factor for CCN 73022 - NCIS Field Office is 1.40.

**730 25 GATE/SENTRY HOUSE (SF)**

**FAC: 1498**

**BFR Required: Y**

73025-1 The gate/sentry house may vary in size from a simple sentry shelter to a building housing a gate guard office, clerical office, and waiting room; or a truck inspection building. See Table 73025-1 for space allowances.

**Table 73025-1  
Space Allowances for Gate/Sentry Houses**

<b>Location</b>	<b>Gross Area allowance</b>
Gate of small activity	6 sq. m or 64 SF
Major gate at medium to large activity	56 sq. m (50 sq. m gate house & 6 sq. m sentry house) or 604 SF (540 SF gate house & 64 SF sentry house)
Secondary gate at medium to large activity	6 sq. m or 64 SF
Truck Inspection Building	Individual justification is required

73025-2 The differentiations between small and medium activities and between major and secondary gates are not given here. A reasonable approach should be taken. If the function requires no more than two guards at a time and no waiting room for persons awaiting clearance, then a sentry house is adequate. Some industrial

installations may have an employment office, first aid room, and safety office located at the gate house. Space for these functions are planned and inventoried as Category Code 610 10 using the appropriate planning factors.

**730 30 BAKERY (SF)**

**FAC: 7321**

**BFR Required: Y**

73030-1 **DEFINITION.** The establishment of bakeries is governed by provisions of DoD instruction 4100.33 – Commercial or Industrial Activities – Operation of. Normally a bakery will be authorized where commercial sources are not available. See Table 73030-1 for space allowances. The rated capacities given are for 8-hour per day operation and increase in direct proportion to the increase in hours of operation.

**Table 73030-1  
Space Allowances for Bakeries**

Number of Persons Served	Gross Area SQ. M./SF		Rated Capacity Kilograms/Pounds	
Bread Bakery				
3,000	418	4,500	560	1,500
8,400	483	5,200	1,570	4,200
16,000	762	8,200	3,130	8,400
26,900	929	10,000	5,010	13,425
Pastry Bakery			(servings)	
2,500	167	1,800	5,000	
5,000	274	2,950	10,000	
10,000	311	3,350	20,000	
20,000	451	4,850	40,000	

**730 35 LOCKER ROOM (SF)**

**FAC: 7382**

**BFR Required: Y**

73035-1 **DEFINITION.** This facility provides locker space for the belongings of military personnel who must vacate their quarters for extended periods of time, for those whose allotted storage space is not sufficient, and for other uses as deemed justified by the Commanding Officer. See Table 73035-1 for space allowances. Allowances from Table 73035-1 may be used for planning purposes; however, a detailed space analysis may give a different square footage depending on the function that is being supported. (Do not double count with other CCNs such as gyms, fitness etc.). This category code must be individually justified for Marine Corps activities.

**Table 73035-1.  
Space Allowances for Locker Rooms**

Strength Supported	Number of Lockers	Gross Area per Locker	
		sq. m	SF
Up to 500	Strength X 0.285	1.07	11.5
501 to 6,000	Strength X 0.285	0.93	10.0
Over 6,000	Strength X 0.285	0.84	9.0

**730 36 LUNCH/LOCKER ROOM (SF)**

**FAC: 7332**

**BFR Required: Y**

73036-1 This facility is generally provided only to support industrial operations and requires specific justification. No planning factors are available.

**730 40 LAUNDRY/DRY CLEANING PLANT (SF)**

**FAC: 7342**

**BFR Required: Y**

73040-1 **REQUIREMENTS.** The establishment of these facilities is governed by provisions of DOD Instruction 4100.33 - Commercial or Industrial Activities - Operation of. Normally they will be authorized only in locations where commercial facilities are not available. See Table 73040-1 for space allowances. For combination with exchange-operated facilities, see notes in Category Code 740 13 and 740 15.

**Table 73040-1  
Space Allowances for Laundries And Dry Cleaning Plants**

Number of Persons Served	Gross Area (1) Laundry and Dry Cleaning Plants	
	sq. m	SF
0 to 2,000	Not Authorized	Not Authorized
2,001 to 4,000	790	8,500
7,001 to 10,000	1,020	11,000
15,001 to 30,000	4,180	45,000

- (1) Does not include boiler plants which are sized as required and are carried under Category Code 821 50.

**730 45      DEPENDENT SCHOOL - NURSERY SCHOOL (SF)**

**This CCN has been deleted. All existing assets should be reassigned to CCN 73061 Dependent School - Consolidated**

**730 50      DEPENDENT SCHOOL - KINDERGARTEN (SF)**

**This CCN has been deleted. All existing assets should be reassigned to CCN 73061 Dependent School - Consolidated**

**730 55      DEPENDENT SCHOOL - GRADE SCHOOL (SF)**

**This CCN has been deleted. All existing assets should be reassigned to CCN 73061 Dependent School - Consolidated**

**730 60      DEPENDENT SCHOOL - HIGH SCHOOL (SF)**

**This CCN has been deleted. All existing assets should be reassigned to CCN 73061 Dependent School - Consolidated**

Ref: [www.odedodea.edu](http://www.odedodea.edu)

73050/55/60-1 The planning and programming for dependent school facilities overseas is currently under the cognizance of Department of Defense Education Activity (DoDEA),. Assistance related to school facility matters may be obtained from DoDEA or their overseas field offices. Each DoDEA region has comprehensive education specifications which should be used in planning dependant school facilities.

The following general notes may be of assistance for preliminary school facilities planning:

73050/55/60-1.1 Dependents school facilities in any overseas area will be planned to accommodate all DoD dependents (Army, Navy, Air Force, and Marine) and dependents of other Federal agencies in the area. In estimating the number of school-age dependents to provide for, the following may prove helpful:

- If an existing school facility is to be expanded, a local survey to determine the average number of school-age children per family may be most accurate.
- If a new school is to be established, the following Navy statistics may serve as a guide: (For Marine overseas the number of accompanied tours is a

function of available housing and is managed by CMC D C/S, manpower. These proportions should be used.)

- Of all officer personnel assigned overseas 62.14% will move families. These families average 1.73 minor dependents per family with 50% of school-age.
- Of all enlisted personnel assigned overseas 31.63% will move families. These families average 1.68 minor dependents per family with 50% school-age.
- The average number of school-age dependents per family may vary from area to area and from mission to mission and may at times exceed one per family. The superintendent/director for dependents' education may provide assistance in this area.

73050/55/60-1.2 In estimating the distribution of dependents by grade, the following average Navy statistics considering all families may help:

Kindergarten	.08 pupils/family
Grade School 1-6	.52 pupils/family
High School 7-12	.26 pupils/family

73050/55/60-1.3 Count all families, with or without children. Again the superintendent/ director for dependent's education in the area may provide assistance.

73050/55/60-2 This scope should be adequate to house the total educational program as developed by the superintendent/director for the area. However, the superintendent/director may wish to alter the utilization of the space to a degree to meet unique requirements of the educational program or the geographic location.

**730 61 DEPENDENT SCHOOL – CONSOLIDATED (SF)**

**FAC: 7352**

**BFR Required: Y**

73061-1 **DEFINITION.** The planning and programming for dependent schools (grades Pre-K or Sure Start program through grade 12) is currently under the cognizance of Department of Defense Education Activity (DoDEA). Assistance related to school facility matters may be obtained from DoDEA HQ which has access to comprehensive education specifications which should be used in planning dependent school facilities.

73061-2 This category code was created to support primarily overseas locations but can be used at any installation where consolidated facilities are recommended. Facilities'



sizing and configuration must be completed in consultation with DODEA officials. Prior to project programming, the proposed project must be validated by DoDEA. The point of Contact for DoDEA Schools is:

Headquarters DoDEA/ Facilities Branch  
4800 Mark Center Drive  
Alexandria, VA. 22350

73061-3 The following steps are required when creating a BFR for a new (proposed) school:

1. Check for the latest design elements in ED SPEC:  
<http://www.dodea.edu/edSpecs/spaceTypes.cfm>. This is a DoDEA website which will outline the current terminology and space planning theory for new DoDEA schools.
2. A spreadsheet is available from \_\_\_\_\_ that will assist you in completing your BFR calculations. Questions about the use of this spreadsheet should be directed to Cal Genereux, NAVFAC Atlantic Criteria Branch, 757-322-4903 or [cal.genereux@navy.mil](mailto:cal.genereux@navy.mil)
3. Contact DoDEA HQ at the above address to obtain the "Program for Design" for your school. This document will supply the necessary staffing and size data to complete your BFR calculation spreadsheet.
4. Output from the spreadsheet must be in proper BFR format before submission to DoDEA for review. Format examples are available from \_\_\_\_\_

### **730 65 FALLOUT SHELTER (SF)**

**FAC: 7383**

**BFR Required: N**

73065-1 **DEFINITION.** There are two kinds of fallout shelters: dual-purpose and single-purpose. A dual-purpose fallout shelter is one which, as a primary purpose, satisfies some other basic requirement such as housing, administrative, storage, etc. and as a secondary purpose, it can provide fallout protection. A single-purpose fallout shelter is a structure or part of a structure whose primary purpose is fallout protection. Dual-purpose shelters are designated in the real property according to their primary purpose. Single-purpose shelters are designated in the inventory as Code 730 65. The construction of single-purpose fallout shelters is not presently authorized. The designation of the number of fallout shelter spaces on existing or new military construction is not presently required.

**730 66 MISCELLANEOUS PERSONNEL WEATHER SHELTER (SF)**  
**FAC: 7384**  
**BFR Required: N**

73066-1 **DEFINITION.** Shelters may be established at bus stops or other locations as required. Provide 0.5 sq.m. (5 SF) per person.

**730 67 BUS STATION (SF)**  
**FAC: 7341**  
**BFR Required: Y**

73067-1 A bus station is a terminal with space for a waiting room and ticket sales. It may be planned as required. Provide 2 sq.m. (20 gsf) per person for the expected waiting group.

**730 74 KENNEL – MORALE, WELFARE & RECREATION OPERATED (SF)**  
**FAC: 7447**  
**BFR Required: N**

73074-1 **DEFINITION.** Use this category code for kennels and quarantine facilities operated as a function of the Morale, Welfare and Recreation (MWR) programs at the Installation. Refer to CCN 730 76 for kennels for military working dogs.

73074-2 **REQUIREMENTS.** The requirements for new kennel facilities are determined by Commander Navy Installation Command (CNIC) Code N9 (Fleet & Family Readiness). The following guidance is used in the project planning for kennel facilities:

73074-2.1 Any proposed new construction must first go through the pre-Internal Needs Validation Study (pre-INVS), full Internal Needs Validation Study (INVS), and Project Validation Assessment (PVA).

73074-2.2 The size of the facility is based upon market analysis and consequent financial projections that must justify programming of the facility.

73074-2.3 Return on Investment (ROI) analysis is based on projected demand, market, revenues, capital investment, and operating and maintenance costs. This type of analysis will determine the financial feasibility of the proposed project and the number and type of units required to ensure a viable outcome. This analysis must follow the requirements of the template developed by CNIC, which is available for download at <http://navymwr.org/>. This category code is for inventory purposes only.

**730 75 PUBLIC TOILET (SF)****FAC: 7385****BFR Required: N**

73075-1 Use this code for inventory of all detached comfort stations except for those in the bachelor housing area. Use Category Code 723 20 Latrine for the bachelor housing area.

**730 76 MILITARY WORKING DOG KENNEL (SF)****FAC: 1445****BFR Required: Y**

73076-1 **DEFINITION.** The Military Working Dog (MWD) Kennel consists of Dog Kennel, Dog Training/Support, and Administrative/Support areas. The following core space designations and rooms for a MWD facility are as follows:

**Administration Area**

- Kennel Master (with closet)
- Trainers
- Handlers
- Storage

**Special Use Areas**

- Tack Room
- Food Storage
- Food Preparation
- Exam Room
- Surgery Room

**Common Use / Support**

- TA-50 Lockers
- Multi-Purpose
- Storage

**Kennel**

- Dog House
- Interior Kennel
- Exterior Kennel

Support spaces for personnel consists of the following:

- Men’s Toilet, Shower, and Locker
- Women’s Toilet, Shower, and Locker
- Janitor Closet Area

73076-2 **REQUIREMENTS.** The table below is a space planning tool for developing the core facility space requirements for each area. Use this category code for Military Working Dog (MWD) kennels and quarantine facilities operated by the Installation security department. Activities must consider using existing facilities or consolidating support functions with other activities. Refer to Table 73076-1 for space allowance areas. Refer to CCN 730 74 for kennels operated by Morale, Welfare & Recreation (MWR).

**Table 73076-1  
Space Allowance for Military Working Dog Kennel**

AREA	NO. OF ROOMS REQUIRED	INDIVIDUAL ROOM REQUIREMENTS	NET USER REQUIREMENTS		COMMENTS
			SF	m <sup>2</sup>	
Kennel Master	1	130	130	12.08	1,4,7
Trainers	1	430	430	39.95	2,4,7
Handlers	1	1,055	1,055	98.01	3,4,7
<b>SUBTOTAL ADMINISTRATION AREA</b>			<b>1,615</b>	<b>150.04</b>	
<b>SPECIAL USE</b>					
Tack Room	1	370	370	34.37	4
Food Storage and Preparation	1	290	290	26.94	4
Exam Room	1	360	360	33.45	4
Surgery	1	105	105	9.75	4
<b>SUBTOTAL SPECIAL USE AREA</b>			<b>1,125</b>	<b>104.51</b>	
<b>COMMON USE / SUPPORT</b>					
TA-50 Lockers	1	540	540	50.17	6
Mult-Purpose Room	1	385	385	35.77	4
<b>SUBTOTAL COMMON USE / SUPPORT</b>			<b>925</b>	<b>85.94</b>	

AREA	NO. OF ROOMS REQUIRED	INDIVIDUAL ROOM REQUIREMENTS	NET USER REQUIREMENTS		COMMENTS
<b>KENNEL</b>					
Dog House	10	15	150	13.94	7
Indoor Kennel	10	80	800	74.32	7
Outdoor Kennel	10	80	800	74.32	7
Interior Kennel Corridor (Conditioned)	1	920	920	85.47	7
Exterior Kennel Corridor	2	400	800	74.32	7
Wet Storage	1	90	90	8.36	7
Dry Storage	1	90	90	8.36	7
<b>SUBTOTAL KENNEL AREA</b>			<b>3,650</b>	<b>339.09</b>	
<b>BUILDING SUPPORT</b>					
Communications Room	1	150	150	13.94	10
Mechanical Room	1	125	125	11.61	10
Electrical Room	1	260	260	24.15	10
<b>SUBTOTAL BUILDING SUPPORPT AREA</b>			<b>535</b>	<b>49.70</b>	10

AREA	NO. OF ROOMS REQUIRED	INDIVIDUAL ROOM REQMTS.	NET USER REQUIREMENTS		COMMENTS
			SF	m <sup>2</sup>	
<b>TOILET, SHOWER, LOCKER</b>					
Men's Toilet, Shower, Locker	1	320	320	29.73	9
Women's Toilet, Shower, Locker	1	315	315	29.26	9
Janitor	1	50	50	4.65	
<b>SUBTOTAL TOILET, SHOWER, LOCKER AREAS</b>			<b>685</b>	<b>63.64</b>	
<b>CIRCULATION</b>					5
Administrative Corridor	1	415	415	38.55	
Support Corridor	1	395	395	36.70	
<b>SUBTOTAL CIRCULATION AREAS</b>			<b>810</b>	<b>75.25</b>	
Outdoor Storage	1	400	400	37.16	8
Dog Break Area	1	200	200	18.58	8
Optional Explosive Storage	1	115	115	10.68	8
Obedience Course	1	11,250	11,250	1,045.13	8

AREA	NO. OF ROOMS REQUIRED	INDIVIDUAL ROOM REQMTS.	NET USER REQUIREMENTS		COMMENTS
<b>TOTAL FACILITY NET FLOOR AREA</b>			<b>8,535</b>	<b>792.92</b>	
CIRCULATION MULTIPLIER OF NET FLOOR AREA	6.5 %		9,090		
NET-TO-GROSS MULTIPLIER	15.0%		10,455		
<b>TOTAL FACILITY GROSS AREA (ROUNDED)</b>			<b>10,460</b>	<b>972</b>	11,12,13
<b>COMMENTS</b>					
<ol style="list-style-type: none"> <li>1 Kennel Master, one per 10 dogs, user defined.</li> <li>2 Trainers, two per 10 dogs, user defined.</li> <li>3 Handlers, one per 2 dogs, user defined.</li> <li>4 Reference: Standard Design – Air Force Military Working Dog Facility.</li> <li>5 A multiplier of up to 10% may be added to the authorized net facility area to support primary circulation.</li> <li>6 TA-50 storage lockers, one per Kennel Master, Trainer, and Handler, user defined.</li> <li>7 Verify the number of dog kennels for each installation.</li> <li>8 Outdoor Training / Support areas are not included in the facility floor area totals.</li> <li>9 Male/Female ratio of 50/50. See UFC 3-420-01 Plumbing Systems for more details.</li> <li>10 Building Support areas are estimates only. Actual sizes are dependent on climate zone, location, system, etc.</li> <li>11 A net-to-gross multiplier of up to 25% is allowed. A 15% net-to-gross multiplier is used per standard design.</li> <li>12 The area square footage is rounded to the nearest whole number.</li> <li>13 This worksheet plans for a one-bay facility of 10,460 square feet (972 m<sup>2</sup>).</li> </ol>					

73076-3 **REQUIREMENTS.** Use the following criteria to plan MWD Kennel Facilities:

73076-3.1 Locate the kennel adjacent to or in proximity to an existing military police facility that provides 24 hour observation of the kennel and also to eliminate the need for separate exterior lighting and fencing.

73076-3.2 Kennel surfaces must be impervious. Surfaces shall have a liquid glaze applied.

73076-3.3 For planning details, floor plans, and construction criteria, reference Standard Design, Air Force Military Working Dog Facility on the *Whole Building Design Guide* at <https://www.wbdg.org/ffc/af-afceec/prototypes-standard-designs>.

73076-4 **DEPARTMENT OF THE NAVY PROGRAM MANAGEMENT** - Reference OPNAVINST 5585.2C, *The Department of the Navy Military Working Dog Program dated 7 September 2012*, for policies procedures, and responsibilities for the administration of the Navy’s MWD program.

The MWD Program Manager reports to the operational chain of command of U.S. Fleet Forces Command.

73076-5 **USMC PROGRAM MANAGEMENT.** For Marine Corps activities, the project manager for MWD requirements is the Security Branch. Program requirements should be submitted to Headquarters USMC D C/S for Plans, Policies, and Operations.

**730 77 PERSONNEL SUPPORT STORAGE (READY ISSUE/SHOP STORES/MISC.) (SF)**

**FAC: 4421**

**BFR Required: Y**

73077-1 Storage facilities for miscellaneous goods related to personnel support facilities will be provided only where it can be individually justified. There are no criteria for this type of facility. Note: This category code is not applicable for Marine Corps activities.

**730 78 DAIRY PLANT (SF)**

**FAC: 7322**

**BFR Required: Y**

No planning factors are available.

**730 82 RECYCLING CENTER (SF)**

**FAC: 8331**

**BFR Required: Y**

73082-1 This facility serves as a collection, sorting, storage, and shipping center for recyclable materials and products. Recycled materials are forwarded to together government or commercial recycling centers. There are no planning criteria for this facility, each requirement will require individual justification with detailed data on operational methods, equipment required, volume of processed containers and need for enclosed building space.

**730 83 RELIGIOUS MINISTRY FACILITIES (SF)**

**FAC: 7361**

**BFR Required: Y**

Project Review: CNIC HQ Force Chaplain  
 Design Criteria: Unified Facilities Criteria (UFC) 4-730-02 "Design: Chapels and Religious Education Facilities" dated 16 January 2004

73083-1 **DESCRIPTION.** Department of the Navy policy is that commanders and commanding officers will provide for the free exercise of religion by military personnel and their dependents through Command Religious Programs. Religious Ministry

Facility (RMF) is a generic term for facility assets used to support Command Religious Programs. RMFs must therefore accommodate the religious rights and needs of a multi-faith, inter-generational, culturally diverse military population.

73083-2 **REQUIREMENTS SPONSOR** - The Chief of Chaplains (OPNAV N097) is the Director of Religious Ministries for the Department of the Navy under SECNAVINST 1730.7D dated 8 August 2008. The CNIC HQ Force Chaplain, in coordination with N097, will determine the required number of RMFs for an Installation, and validate the size of each RMF, as well as the allocation of space within each RMF. The RMFs located within hospitals are treated as a unique requirement (refer to section 73083-4 for additional guidance).

73083-3 **SPACE CRITERIA** - The space planning requirements for RMFs are determined by four factors:

- 1) Population for whom ministry will be provided,
- 2) Environmental factors, including types of religious programming provided,
- 3) Number of seats in each RMF, and
- 4) Number of RMF's at the installation.

73083-3.1 **Factor 1: Installation Population**

73083-3.1.1 **Definition.** Installation population is defined as military strength assigned to the military installation plus their dependents.

73083-3.1.2 **Multiple Installations.** For multiple installations located in the same geographic area, installation population is defined as the military strength, plus their dependents, for which ministry should be provided at the RMF. The Chief of Chaplains will decide which military strength, plus their dependents, will be used to calculate each installation's space allowance for an RMF (s) when there are multiple installations in the same geographic area. This should be determined when developing the Basic Facilities Requirement (BFR). The same military strength can never be used to justify a space allowance for RMFs at more than one installation. Ministry provided for personnel and their dependents remain the responsibility of the command to which the personnel are attached.

73083-3.1.3 **Training Installations.** For Training installations, a weighted average on board count of students should be included in the military strength.

73083-3.1.4 **Authorized Civilian Personnel.** Authorized civilian personnel, and their dependents, shall be included in the population count when dependent on the military installation for religious support.

73083-3.1.5 **STEP 1: Determine Installation Population.**

- Using the definition above, determine the military strength (and civilian when applicable) for whom ministry will be provided at the RMF (s).



- Determine the number of dependents from actual Family Housing Survey figures. If actual data is unavailable, estimate the number of dependents by first determining the number of military personnel (and civilian when applicable) with dependents. Multiply this number by Navy and Marine Corps service-wide average number of dependents (currently 2.6).
- Add the military strength (civilian when applicable) with the dependents from the steps above to determine the Total Installation Population = \_\_\_\_\_ pn.

73083-3.2 Factor 2: **Environmental Adjustment Factors (EAFs)**

73083-3.2.1 **Basis for the EAF.** The EAF is based on the number of major faith group facilities in the surrounding civilian community within 8 km (5 miles) of the installation gate. For this criteria, use only these major faith groups: Baptist/Independent Fundamentalist, Disciples of Christ/ Methodist/ Presbyterian/ United Church of Christ, Episcopalian/ Lutheran/ Pentecostal, and Roman Catholic.

73083-3.2.2 Factors determining Geographical Distribution of Housing

- |                |  |
|----------------|--|
| <b>Close</b>   | <b>80 %</b> or more of installation population reside on installation or within a distance of <b>three kilometers (two miles)</b> .  |
| <b>Normal</b>  | Less than <b>80%</b> of the installation population reside on installation or within a distance of <b>three kilometers (two miles)</b> but more than <b>40%</b> reside within a distance of <b>eight kilometers (five miles)</b> . |
| <b>Distant</b> | Less than <b>40%</b> of installation population resides on installation or within a distance of <b>eight kilometers (five miles)</b> .   |

73083-3.2.3 **STEP 2: Use the EAFs to adjust installation Population.**

- Count the number of **major faith groups** which have at least one facility within **eight kilometer (five miles)** of the installation gate.
- Determine the **housing distribution** from the definition above.
- **Refer to Table 73083-1 below.** Find the number of major denomination churches determined and read across the table to find the **Housing Adjustment**. **Multiply** this **factor** by the **total installation population** (determined in STEP 1) which will give you an **Adjusted Installation population = \_\_\_\_\_ pn**

**Table 73083-1.  
Environment Adjustment Factor for RMFs**

FAITH GROUPS Number of <b>major faith group facilities</b> in the surrounding civilian community within <b>8 kilometers (5 miles)</b> of the installation gate	HOUSING		
	CLOSE	NORMAL	DISTANT
0	1.00	0.69	0.46
1	0.84	0.63	0.43
2	0.76	0.58	0.38
3	0.69	0.52	0.35
4	0.61	0.46	0.30
5	0.53	0.40	0.26

73083-3.3 Factor 3: **Number of Seats in each RMF**

73083-3.3.1 **STEP 3: Determine Total Number of Common Assembly Seats below:**

- Use **Adjusted Installation Population** (STEP 2) and **Table 73083-2** to determine the total number of **Common Assembly seats** = \_\_\_\_\_ for the installation (column 2, Table 73083-2).

**Table 73083-2  
Number of Seats in Common Assembly Areas at an Installation**

Column 1. Adjusted Installation Population	Column 2. Number of Common Assembly Seats
Up to 500	35
501 to 1,000	200
1,001 to 1,500	300
1,501 to 2,000	400
2,001 to 2,500	500
2,501 to 3,000	600
3,001 to 3,500	700
3,501 to 4,000	800
4,001 to 5,000	900
5,001 to 6,000	1,000
6,001 to 7,000	1,100
7,001 to 8,000	1,200
8,001 to 9,000	1,300

Column 1. Adjusted Installation Population	Column 2. Number of Common Assembly Seats
9,001 to 10,000	1,400
10,001 to 11,000	1,500
11,001 to 12,000	1,600
12,001 to 13,000	1,700
13,001 to 14,000	1,800
14,001 to 15,000	2,000
13,001 to 14,000	1,800
14,001 to 15,000	2,000
15,001 to 16,000	2,100
16,001 to 17,000	2,100
17,001 to 18,000	2,200
18,001 to 19,000	2,200
19,001 to 20,000	2,300
20,001 to 21,000	2,400
21,001 to 22,000	2,400
22,001 to 23,000	2,500
23,001 to 24,000	2,500
24,001 to 25,000	2,600
25,001 to 26,000	2,700
26,001 to 27,000	2,700
27,001 to 28,000	2,800
28,001 to 29,000	2,900
29,001 to 30,000	3,000
For each add 'l 1,000 add:	100

#### 73083-3.4 Factor 4: **Determine Number of RMFs**

- STEP 4:** Use the total number of seats in common assembly areas at an installation (**STEP 3**), the installation's mission, and the types of religious programming required to adequately meet the religious needs and rights of assigned sea service personnel and their dependents, and economical considerations to determine the number of RMFs. RMFs will normally be built in one or a combination of several sizes up to a maximum of 600 seats in common assembly areas, i.e., the sum of the seating in all of the common assembly areas within the RMF should generally not exceed 600 seats. Smaller size RMFs are intended primarily for use at small installations. For example, to satisfy a requirement for 1200 seats, two 600 seat RMFs should be planned rather than three 400 seat RMFs on a typical Navy base; a 1200 seat RMF is more practical at a training center. **Typically, RMFs will be built with the largest common assembly space seating from 250pn to 500pn.** Some installation, such as training

centers, may want the convenience of one large RMF assembly area under one roof to accommodate the different congregations in separate areas. Except in unique situations, and with the concurrence of the Chief of Chaplains, the total requirements at an installation will not exceed that authorized by Table 73083-3.

**73083-3.5 Space Allocations for RMFs**

73083-3.5.1 **RMFs** are comprised of six (6) different types of spaces (an approximate percentage of total space is in parentheses): **1. Worship** (35-85%), **2. Religious Education** (10-40%), **3. Pastoral Counseling** (1-12%), **4. Fellowship** (1-20%), **5. Pastoral Administration** (1-20%), and **6. Utility/Support** (1-5%). Adequate and appropriate provisions for all six types should be provided within the criteria. These are contingent on the mission of the installation, religious programming, and needs/rights of assigned personnel and their dependents. **The Chief of Chaplains will decide space allocations within RMFs.**

73083-3.5.2 Within each of the six different types of space, part of the requirement will depend primarily upon the **number of RMFs at an installation** and part of the requirement will depend primarily upon the **adjusted installation population**. Examples of the former include **sacristy, reconciliation room, chancel, reception, and kitchen**. Examples of the latter include **religious education spaces, chaplain’s offices and fellowship halls**. Thus the square foot requirement for each RMF has two separate components each of which must be determined separately.

**73083-3.5.3 STEP 5: Determine Total First Component Requirement Based Primarily upon the Number of RMFs.**

- Use the **number of seats for each RMF** (STEP 4) to determine the **first component** of the gross square foot requirement for the RMF from Column 2 in Table 73083-3. The first component is that portion of the requirement which is primarily dependent upon the number of common assembly seats in the RMF. First component total of **RMF Gross Area Requirement** = \_\_\_\_\_ (sum of the first components of RMF Gross Req. for each RMF).

**Table 73083-3  
First Component of RMF Gross Area Requirement (for each RMF)**

Column 1 Number of Assembly Seats	Column 2 First Component RMF Gross Area	
	sq.m.	SF
35	186	2,000
200	604	6,500

Column 1 Number of Assembly Seats	Column 2 First Component RMF Gross Area	
	sq.m.	SF
300	794	8,550
400	948	10,200
500	1,070	11,500
*600 <sup>1</sup>	1,240	13,320
700	1,370	14,700
800	1,490	16,000
900	1,590	17,100
1,000	1,670	18,000
1,100	1,740	18,700
(Maximum for one RMF) 1,200	1,780	19,200

Note 1: When greater than 600 seats, consider the use of multiple RMFs. Use this table to size each one.

**73083-3.5.4 STEP 6: Determine Second Component Requirements Based Primarily upon the Adjusted Installation Population.**

- Use the **adjusted installation population** (STEP 2) to determine the **second component** of the gross square meter (square foot) requirement for RMFs at the installation from the Column 2 of Table 73083-4. The second component is that portion of the requirement which is primarily dependent upon the adjusted installation population. Total second component of **RMF Gross Area Requirement for the installation = \_\_\_\_\_**.

**Table 73083-4  
Second Component of RMF Gross Area Requirement**

Column 1 Adjusted Installation Population	Column 2 Second Component RMF Gross Area	
	sq.m	SF
Up to 500	93	1,000
501 to 1,000	372	4,000
1,001 to 1,500	411	4,420
1,501 to 2,000	450	4,840
2,001 to 2,500	489	5,260
2,501 to 3,000	528	5,680
3,001 to 3,500	567	6,100
3,501 to 4,000	606	6,520

Column 1 Adjusted Installation Population	Column 2 Second Component RMF Gross Area	
	sq.m	SF
4,001 to 5,000	684	7,360
5,001 to 6,000	762	8,200
6,001 to 7,000	840	9,040
7,001 to 8,000	918	9,880
8,001 to 9,000	996	10,720
9,001 to 10,000	1,070	11,560
10,001 to 11,000	1,150	12,400
11,001 to 12,000	1,230	13,240
12,001 to 13,000	1,310	14,080
13,001 to 14,000	1,390	14,920
14,001 to 15,000	1,460	15,760
15,001 to 16,000	1,540	16,600
16,001 to 17,000	1,620	17,440
17,001 to 18,000	1,700	18,280
18,001 to 19,000	1,780	19,120
19,001 to 20,000	1,850	19,960
20,001 to 21,000	1,930	20,800
21,001 to 22,000	2,010	21,640
22,001 to 23,000	2,090	22,480
23,001 to 24,000	2,170	23,320
24,001 to 25,000	2,240	24,160
25,001 to 26,000	2,320	25,000
26,001 to 27,000	2,400	25,840
27,001 to 28,000	2,480	26,680
28,001 to 29,000	2,560	27,520
29,001 to 30,000	2,530	28,360
For each additional 1,000 add	78	840

**73083-3.5.5 STEP 7: Allocate Second Component of Gross Area Requirement to each RMF.**

- Apportion the total installation second component Gross Area requirement determined in STEP 6 among each of the RMFs authorized for the installation in STEP 4. Factors to be considered in the apportionment of Gross Area in each RMF are the **Installation's Mission, the Installation's Geography, and**

**Religious Programming.** The Chief of Chaplains shall approve the apportionment.

*Examples:*

1. A large installation with a remote family housing may want one RMF in the housing area and another adjacent to the BEQs
2. A training command may want one RMF for students and another for permanent population.

**73083-3.5.6 STEP 8: Determine the Total Gross Area Requirement for each RMF at the installation.**

- To determine the total gross area requirement for each RMF at an installation, add the first component requirement (STEP 5) to the second component (STEP 7) and multiply the sum by a factor of 1.1 (this allows for mechanical, electrical, and communication equipment spaces).

**Total Gross Area Requirement for the RMF = (STEP 5 \_\_\_\_ + STEP 7 \_\_\_\_ ) x (1.1) RMF = \_\_\_\_\_ Gross Area**

**73083-3.5.7 STEP 9: Determine the Total Installation RMF Gross Area Requirement**

- Repeat STEP 8 for each RMF at the installation.
- The **total installation RMF Gross Area Requirement** is the **sum** of the **Gross Area Requirements for each RMF** at the installation (include any RMF within a hospital which is part of the installation).

**Total Installation RMF Requirement = \_\_\_\_\_ Gross Area**

**73083-4 HOSPITAL RMFs.**

73083-4.1 To serve patients and staff personnel on duty within composite medical facilities, in-hospital RMFs may be provided. The hospital RMF will be coded as Category Code 730-83. **Space allocated to the hospital RMF is to be included in the installation totals computed above.** Use Table 73083-5 to compute Hospital RMFs.

**Table 73083-5. Space Allocation for Hospital RMFs**

Hospital Size (Beds)	Gross Area Note (1)	
	sq.m	SF
26 to 99	34	364

Hospital Size (Beds)	Gross Area Note (1)	
	sq.m	SF
100 to 199	102	1,100
Over 200	130	1,400

- (1) Add an additional 5-10% (dependent on local conditions) of the buildings gross area for mechanical, electrical, and communication equipment space (s).

### 730 85 POST OFFICE

FAC: 7344

BFR Required: Y

73085-1 **CENTRAL POST OFFICE.** Space allowances for central post offices are given in Table 73085-1. These figures represent normal allowances and are given for general guidance. Additional space may be provided if a central post office serves specialized functions on an installation such as:

- Postal directory.
- Nonresident schools
- Major and subordinate headquarters, commands, personnel centers, service schools, major hospitals, air material areas, supply depots.
- Carrier delivery to family housing units.
- Activities generating high volume of accountable mail that requires overnight vault storage.
- Self-service postal units installed within the lobby of the facility.

73085-2 **CONUS INSTALLATIONS.** At CONUS installations (see footnote 4 of Table 73085-1), the determination of specific total requirements and provisions for the specialized functions listed above, shall be coordinated with the U.S. Postal Services Regional Postmaster General. This should be accomplished during the initial planning stage and the DD Form 1391 should be annotated to that effect.

73085-3 **POSTAL SERVICE CENTER.** When justified by specific requirements and approved by the U.S. Postal Services Regional Postmaster General, a postal service center may be provided at which mail may be deposited and picked up by individual post office box holders, as opposed to bulk distribution of mail to the various elements on a military installation. A postal service center may be combined with, or separate from, a central or branch post office. The number of boxes shall not exceed the number of unmarried and unaccompanied married military civilian personnel plus 25% to accommodate specific key personnel and compensate for box reassignment vacancy period. Space allowances per box are given in Table 73085-1.



73085-4 **BRANCH POST OFFICES.** At large installations with personnel concentrations located at such a distance from the central post office that service through the latter is impractical, branch offices, each not exceeding 139 sq.m. (1,500 GSF) may be provided.

73085-5 **FOR BASIC FACILITY REQUIREMENTS PURPOSES,** the total requirement for Code 730 85 is the sum total of central post offices, postal service centers and branch post offices.

**Table 73085-1.  
Space Allowances for Post Offices**

Installation Population (1)	Central Post Office Gross Area (2)		Postal Service Center Gross Area Per Box (3)			
			CONUS (4)		OVERSEAS (5)	
	sq.m	SF	sq.mm	SF	sq.mm	SF
Up to 500	37	400	55700	0.60	55700	0.60
501 to 1,000	56	600	55700	0.60	55700	0.60
1,001 to 2,500	162	1,750	55700	0.60	46500	0.50
2,501 to 4,500	272	2,925	55700	0.60	46500	0.50
4,501 to 7,500	418	4,500	55700	0.60	41800	0.45
7,501 to 11,500	588	6,325	55700	0.60	37200	0.40
11,501 to 16,500	766	8,250	55700	0.60	37200	0.40
16,501 to 22,500	941	10,125	55700	0.60	37200	0.40
22,501 to 28,500	1,160	12,525	55700	0.60	37200	0.40
28,501 to 34,500	1,390	14,925	55700	0.60	37200	0.40
34,501 to 40,500	1,610	17,325	55700	0.60	37200	0.40
40,501 to 46,500	1,830	19,725	55700	0.60	37200	0.40
46,501 to 52,500	2,060	22,125	55700	0.60	37200	0.40
52,501 to 58,500	2,280	24,525	55700	0.60	37200	0.40

Notes:

- (1) The space criteria for a military postal facility shall be based on the total population, including: military personnel and approved DoD civilians/dependents and contractors, serviced by the postal facility. Consider a sponsor and authorized family members as one person. (Department of Defense Postal Manual, DoD 4525.6-M as amended)
- (2) Excludes space required for loading platforms.
- (3) Allowed only when justified by specific requirements and approved by the U.S. Postal Services Regional Postmaster General. Number of boxes shall not

- exceed the number of unmarried and unaccompanied married military and civilian personnel plus 25% for key official military and civilian personnel needs.
- (4) CONUS include the 50 States and all other geographical areas in which the U.S. Postal Service operates.
- (5) Use 55700 sq.mm. (0.60 SF) per box throughout when the postal service center is separated from the central post office. Do not assign a receptacle to more than one person. Consider a sponsor and authorized family members as one person. The square footage of postal service centers is in addition to the central post office. (Department of Defense Postal Manual DoD 4525.6-M as amended)

## 740 COMMUNITY FACILITIES

### 740-1 MORALE, WELFARE AND RECREATION (MWR), NAVY EXCHANGE (NEX), AND OTHER SUPPORT FACILITIES (INDOOR)

#### 740-1.1 General Notes

#### 740-1.2 Space Allowances

740-1.2.1 **Construction Allowances.** These allowances apply to all funding sources and types of construction.

740-1.2.2 **Installation Requirements.** Facilities shall be planned to meet the specific requirements of an installation and not arbitrarily to the maximum allowances indicated. An installation will not automatically qualify for all facilities listed but only for those for which specific requirements exist.

740-1.2.3 **Activities.** Minor exchange facilities operated for the convenience of non-exchange activities that are an integral part of these activities such as barber shops in clubs; food, retail outlets in air terminals, hospitals, schools or large administration buildings; food service in bowling alleys, operations buildings, and service clubs; and snack facilities in theaters are included in the space allowances authorized for the non-exchange activities.

740-1.2.4 **Mechanical Equipment Rooms.** Mechanical equipment room space as required should be added to the gross area in the criteria tables. This space varies from 5-10% of the gross area.

#### 740-1.3 Conversion of Existing Facilities

740-1.3.1 A new facility will be provided only when no existing available structure will satisfy the requirements. When an existing structure is converted for morale, welfare or recreational uses, the space allowances may be increased

by not more than 20 percent when necessary to effect economical use of the existing structure. This increase is not allowed in cases where an existing structure is expanded by new construction to accommodate such uses.

#### 740-1.4 **Anti-Terrorism / Force Protection (AT/FP) Considerations**

740-1.4.1 For High Density facilities, such as many of the 740 series MWR facilities and Exchange facilities, AT/FP must be considered in the planning process. AT/FP siting and setback requirements should be considered early on. Please reference the Navy Minimum Standards for AT/FP for definitions, set back requirements, and additional information. Webpage: <https://www.wbdg.org>.

#### 740-1.5 **Covered/Enclosed Malls and Sidewalks**

740-1.5.1 Where elements of a community shopping center, such as the exchange main retail store, snack bar, exchange service outlets, commissary, credit union and a bank, are combined in a common structure and connected by a covered mall, space occupied by the mall will not be charged against (deducted from) space allowances for the respective elements. Likewise, where such elements are in proximity to each other and are connected by a covered walkway, space occupied by the covered walkway will not be charged against space allowances for the respective elements. Entrance canopies should not be counted against the building space allowance.

#### 740-1.6 **Construction from Private Funds / PPV Initiatives**

740-1.6.1 The construction of exchange facilities on military installations may be accomplished from funds of commercial concerns or private individuals subject to the approval of the Secretary of their cognizant Military Department, when pertinent contracts between commercial concerns or private individuals and the exchange specifies that immediately upon completion title thereto passes to the government and stipulate conditions and restrictions that should prevent any future conflict with military requirements, and eliminate any future obligations against appropriated funds. The requirement for passage of the title should not apply to portable or relocatable buildings.

### **740-2 MORALE, WELFARE AND RECREATION (INDOOR)**

#### 740-2.1 **General instructions**

#### 740-2.2 **Using the criteria**

740-2.2.1 **Size to Accommodate Demand.** These criteria provide the current approach to determining allowances for Morale, Welfare and Recreational (MWR) facilities. Facility allowances are sized to accommodate the

projected demand for the anticipated functions. This sizing involves a three-step procedure:

740-2.2.1.1 **Estimate Projected Demand.** Calculate the demand for each functional component of the facility using the demand calculation tables. Then apply any special adjustment factors in the criteria.

740-2.2.1.2 **Determine Capacity Requirements.** Derive the number of required functional units by multiplying the demand by the capacity factors in the criteria.

740-2.2.1.3 **Calculate Space Allowances.** Apply the space allocation factors to determine the square footage required for each functional component. Add the areas for all components, plus support area factors indicated in the criteria, to determine the total facility allowance. For each step in this planning process, follow the calculations and instructions provided in the criteria for each facility type. In addition to the criteria stated in *NAVFAC P-80*, attention should be given to relevant planning information in the Base Master Plan, Overview and Functional Regional Plans (RSIPs), UFC Criteria, Design Manuals, Military Handbooks or Instructions for the specific facility type.

740-2.2.2 For **Marine Corps Installations** results of the **MWR Construction Program Patron Survey** will be used to provide Marine Corps specific patron desires. Construction Program Patron Survey data is available from the **Commandant of the Marine Corps**.

740-2.2.3 Space Allowance Flexibility

#### 740-2.2.3.1 **Modular Space Allowances**

For many of these criteria, usage demand, capacity requirements and space allowances are calculated separately for component function-areas of the facility, and then totaled to derive overall facility space allowances. This procedure is designed to respond to local variations in the set of activities and spaces provided, and the relative demand for different activities depending on the needs of the installation population. This approach can also accommodate diverse existing facility situations, when considering additions or complementary new facilities.

#### 740-2.2.3.2 **Space Programs versus Facility Allowances**

These criteria are used to determine the total space allowance for a facility. Even though area calculations for functional components of the

facility are used in deriving the overall allowance, this does not fix the space sizes of the component program areas of the facility. Local installation decisions, in the space programming and design process, should determine the appropriate allocation of areas for each function-space within the total facility allowance.

#### 740-2.2.3.3 Local Variation

Local demand for program activities may depend on a variety of factors, in addition to the overall installation population, including:

- Proportion and relative participation of different user groups among the population.
- Specific program of activities provided.
- Competing on-base and off-base facilities providing similar programs.
- Geographic distribution and accessibility of the user populations.
- Local climate conditions and operating seasons.
- Overseas situations and local customs.

#### 740-2.2.4 Population Basis for Demand Calculations

Chapter 1 of this instruction for information on population definitions and base loading data.

### 740-3 MWR FACILITIES, GENERAL NOTES

740-3.1 The involvement of MWR representatives in the planning process is required, especially for all Category C business-based projects, in order to ensure a match between program needs, and the types and sizes of spaces to be provided. See below for a listing of Category A-C facilities as defined by MWR.

740-3.2 MWR programs are funded by a combination of non-appropriated funds (NAFs) and appropriated funds (APFs). MWR activities are divided into three categories following DoD policy on funding and function:

740-3.2.1 **Category A** operations are considered essential in meeting the organizational objectives of the Military Services. They shall be

funded almost entirely with APF, with the use of NAF limited to specific instances where APF support is prohibited by law or where the use of NAF is essential for the operation of a facility or program. These facilities do not generate any NAF revenues. Examples are gymnasiums, libraries, and sports programs.

740-3.2.2 **Category B** operations are mission enhancing community support programs that support military members and their families. These programs are primarily supported by APF support, but do generate NAF revenues. Examples are outdoor recreation, child development, hobby shops, ITT, community pools, school age care, and youth development programs.

740-3.2.3 **Category C** operations are business-based activities and are authorized minimal APF (such as SRM, environmental compliance, security, and health and safety support; interior renovation and new construction/additions are NAF funded) except at isolated/remote and OCONUS installations where Category C operations are treated the same as Category B operations. Examples are food and beverage operations, bowling centers, cottages, RV parks, slip rental marinas, and golf courses.

For Category B and C facilities an initial market survey and financial analysis or pro forma is required to determine if the facility will be self-sustaining or profitable, in the case of Category C operations. Once the Installation has completed their analysis, the proposal will be submitted via the regional command to NPC (after 1 October 2004, CNIC Field Support Activity) through an Internal Needs Validation Study (INVS). If the project earns sufficient points through the INVS, it will move on to the Project Validation Assessment stage where the demand and scope will be confirmed through independent review.

740-3.3 For overseas activities the net to gross factor (typical net to gross is 1.25 or 25%) will increase as necessary to meet host nation building codes.

#### 740-3.4 **Recreational Planning Context**

Planning for MWR facilities should involve consideration of the individual facility in relationship to a comprehensive recreational program and facilities plan for the installation. Consider the following factors, in addition to those relationships specifically indicated in the criteria for each facility:

- If other MWR facilities serving the same user population provide the same program activities, reduce the allowed capacity of the proposed facility by the capacity provided elsewhere at the installation.

- Consider collocating the facility with other recreational facilities providing complementary programs, to provide the users with the increased convenience and attractiveness of clustered activities, and to take advantage of potential savings in support space requirements and operating costs.
- Size and locate an individual facility appropriately to the target population and geographical area its particular function is designed to serve. Convenient access for users should be considered in balance with the need for efficient facility operation and avoidance of duplicate facilities.

#### **740-4 NAVY EXCHANGE FACILITIES, GENERAL NOTES**

740-4.1 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535.

740-4.2 The Navy Exchange Service Command, Planning Branch uses a Business Case Analysis model to plan new Navy Exchange facilities. They calculate square footage of new facilities based on sales costs for various product lines and expected sales costs and product lines for new facilities compared to existing facilities. They also incorporate a Market analysis of like facilities in the area. Exchange facilities Navy Facility Category Codes and descriptions are included in this Criteria document; however Navy Planners are instructed to contact the Navy Exchange Service Command for requirements development when a new facility is potentially required. If BFRs are being updated or calculated for existing facilities, in most cases it is reasonable to assume that the requirements are equal to the assets for NEX facilities. Recommend that the Navy facilities planners confirm this determination with NEXCOM prior to setting requirements equal to assets.

#### **740 01 EXCHANGE RETAIL STORE (SF)**

**FAC: 7346**

**BFR Required: Y**

74001-1 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535. See General Notes for NEX facilities at the beginning of the 740 Series.

74001-2 The exchange retail store is planned as part of an authorized Navy or Marine Corps Exchange. The store includes sales area, immediate back-up stock area, store office, toilets and circulation space. The space allowances for exchange retail stores are determined by the Navy Exchange Services Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452, 757-631-3535. The Patron base for the Main NEX Retail Store is all active duty, retirees and families/dependents. All merchandise categories are included in the Main NEX Retail Store. Some categories may be stronger or weaker according to age or rank classifications or base or command populace.

#### **740 02 LOCATION EXCHANGE (SF)**

This category code has been deleted. All existing assets should be reassigned to category code 740 01, Exchange Retail Store.

#### **740 03 EXCHANGE CENTRAL ADMINISTRATION (SF)**

**FAC: 7387**

**BFR Required: Y**

74003-1 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535. See General Notes for NEX facilities at the beginning of the 740 Series.

74003-2 This is space required for the general administrative effort of an exchange such as accounting, payroll, personnel, purchasing or warehousing. Space required for this facility will be calculated using code 610 10, Administrative Office criteria. Administrative space required for an individual exchange facility, such as office space in warehouses, cafeterias, main retail store or location exchange, shall be provided out of the space authorized for the individual facility.

#### **740 04 EXCHANGE FOOD SERVICE (SF)**

**FAC: 7331**

**BFR Required: Y**

74004-1 These facilities include: cafeterias, specialty shops similar to deli, fast food and pizza, bake shops, ice cream shops, etc. Non-Exchange food service facilities (standalone) are captured under category code 740 46. Food service facilities operated in and for the sole convenience of non-exchange activities such as bowling alleys, theaters, air terminals and similar functions are already included in the basic space allowance for such activities.



74004-2 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535. See General Notes for NEX facilities at the beginning of the 740 Series.

74004-3 MWR Facilities will be coordinated with CNI (N9, N25) and local MWR personnel. See MWR General Notes at the beginning of the 740 Series.

#### **740 06 NON-EXCHANGE INSTALLATION RESTAURANT (MWR) (SF)**

**FAC: 7332**

**BFR Required: Y**

74006-1 This type of facility includes Category "C" MWR dining facilities, including commercial restaurants. Examples of standalone commercial restaurants are Applebee's, McDonald's, etc. For other restaurants found in an Exchange building, or walk-up commercial eateries with common seating areas such as Subway, Taco Bell, Kentucky Fried Chicken (KFC), etc. is covered under category code 740 04, Exchange Food Service.

#### **740 08 EXCHANGE FOOD STORE (GROCERY) (SF)**

**This CCN has been deleted. All existing assets should be reassigned to CCN 74001 EXCHANGE RETAIL STORE**

#### **740 09 EXCHANGE SERVICE OUTLETS (BARBER, UNIFORM, ETC) (SF)**

**FAC: 7346**

**BFR Required: Y**

74009-1 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535. See General Notes for NEX facilities at the beginning of the 740 Series.

74009-2 Exchanges are authorized outlets for basic services in conjunction with the retail store, such as Barber Shop, Tailor/Uniform Shop, Radio/TV Repair Shop, Portrait Studio, Watch Repair Shop, Optical Shop, Beauty Salon, and Personal Services. In addition to specific outlets as listed above, special outlets may be authorized for which no distinct space allowances are given. Examples of such outlets are: CONUS and OVERSEAS - taxicab and bus service spaces, toylands, flower shops, baggage checkpoints; OVERSEAS only - steam-bath facilities, new car sales points, stock investment offices.

**740 11 NEX DEPOT (SERVMART) (SF)****FAC: 7346****BFR Required: Y**

74011-1 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535. See General Notes for NEX facilities at the beginning of the 740 Series.

74011-2 An NEX Depot may be provided as dictated by NEXCOM. NEX Depots are similar to traditional Navy Servmarts, and offer the same type of inventory, in a more convenient setting.

**740 12 RED CROSS/NAVY RELIEF (SF)****FAC: 6100****BFR Required: Y**

74012-1 Space for Red Cross and/or Navy Relief functions can be provided within the Family Services Center (Code 740 25) when available. This space however should not be counted against the requirements for Family Services Center. Space may be provided in other facilities on base when available. This space is not counted against Navy requirements.

**740 13 EXCHANGE LAUNDRY AND DRY CLEANING FACILITY (SF)****FAC: 7342****BFR Required: Y**

74013-1 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535. See General Notes for NEX facilities at the beginning of the 740 Series.

74013-2 Laundry and dry cleaning plants, which may be operated under the exchange service, normally shall be limited to non-appropriated fund, cleaning and laundering.

**740 16 EXCHANGE MAINTENANCE SHOP (SF)****FAC: 7387****BFR Required: Y**

74016-1 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535. See General Notes for NEX facilities at the beginning of the 740 Series.

74016-2 An exchange maintenance shop may be provided for the local repair of exchange equipment, fixtures repair of refrigeration equipment and vending machines, and to provide shop space for facility maintenance crews and personnel.

**740 18 BANK (SF)****FAC: 7347****BFR Required: Y**

74018-1 Banks may be established only when they are authorized by the U.S. Treasury Department. Normally there will be only one banking facility at each installation. Branch banks, providing complete services, shall not be established without prior approval. Space allowances are given in Table 74018-1.

**Table 74018-1. Space Allowances For Banks**

<b>Personnel Strength (1)</b>	<b>Gross SF</b>	<b>Personnel Strength (1)</b>	<b>Gross SF</b>
Up to 1,000	1,500	7,001 to 9,000	5,560
1,001 to 2,000	2,375	9,001 to 11,000	6,375
2,001 to 3,000	3,250	11,001 to 13,000	7,190
3,001 to 4,000	3,625	13,001 to 15,000	8,000
4,001 to 5,000	4,000	15,001 to 17,000	10,000
5,001 to 6,000	4,375	17,001 to 20,000	13,000
6,001 to 7,000	4,750	Over 20,000	See Note (2)

Notes:

- (1) Active duty military personnel assigned to an installation and stationed within a commuting area not served by another military banking office plus civilian employees of the installation.
- (2) Determined by Engineering Study.

**740 19 CREDIT UNION (SF)**  
**FAC: 7347**  
**BFR Required: Y**

74019-1 **DESCRIPTION.** Credit unions are private cooperative savings and loan organizations. Facilities for a properly chartered credit union may be provided to serve military personnel, their dependents, and other personnel as permitted in the bylaws of the credit union. If a credit union on an installation restricts or limits membership of installation personnel, it will be denied free use of installation facilities. In such cases another credit union which meets DOD requirements may be organized and provided with logistic support.

74019-2 **SPACE ALLOWANCE.** Space allowances for credit unions are predicated on size of membership, number of transactions, assets, accounting methods, and number of employees. Each of the variables contributes a number of points, and the total number of points determines the space allowance. The allowance may be increased by 10 percent to accommodate future business expansion. Refer to Table 74019-1 for point values and Table 74019-2 for space allowances.

**Table 74019-1. Point Values for Credit Unions**

<b>Number of Members</b>	<b>Points Allowed</b>	<b>Point Subtotals</b>
0 to 1,000	2	
1,000 to 2,500	4	
2,501 to 7,500	6	
7,501 to 12,000	8	
12,001 to 20,000	10	
For Each Additional 10,000, add	2	
<b>Accounting</b>	<b>Points</b>	
Machines	1	
Manual	2	
<b>Assets (Dollars)</b>	<b>Points</b>	
0 to 100,000	1	
100,001 to 500,000	2	
500,001 to 1,500,000	3	
1,500,001 to 5,000,000	4	
Over 5,000,000	5	
<b>Transactions Per Day</b>	<b>Points</b>	
0 to 99	1	
100 to 299	2	
300 to 499	3	
500 to 749	4	
750 to 999	5	
For Each Additional 500, add	1	
<b>Number of Employees</b>	<b>Points</b>	

Number of Members	Points Allowed	Point Subtotals
2 to 5	1	
6 to 9	2	
10 to 13	3	
14 to 17	4	
18 to 21	5	
22 to 25	6	
For Each Additional 3, add	1	
<b>TOTAL NUMBER OF POINTS =</b>		

Refer to Table 74019-2 for Space Allowance.

**Table 74019-2  
Space Allowances for Credit Unions**

Point Totals	Gross SF
0 to 4	800
5	1,000
6	1,300
7	1,700
8	2,200
10	2,800
12	3,500
14	4,300
16	5,200

Point Totals	Gross SF
18	6,200
19	7,200
20	8,200
21	9,200
22	10,200
23	11,200
24	12,200
25	13,200
For each additional point, add	1,000

**740 20 PCS OFFICIAL LODGING (SF)**  
**FAC: 7441**  
**BFR Required: N**

74020-1 **REQUIREMENT.** Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535. See General Notes for NEX facilities

at the beginning of the 740 Series. This category code should not be used to compute a Basic Facility Requirement (BFR).

74020-2      **DESCRIPTION.** These facilities are temporary living accommodations which normally are rented for a service charge for overnight or short term use to authorized personnel such as: official military or civilian visitors to the installation, visitors to installation personnel, transient personnel or families awaiting assignment to quarters. Included are motels, hotels, and apartments. Where such facilities are authorized for new construction, they shall be of motel type with bath and with kitchenettes, if required. Living units with kitchenettes shall contain no more than 450 square feet of living area and those without kitchenettes no more than 425 square feet. Appropriate circulation, administration, mechanical and service space will be provided.

74020-3      **REVIEW.** All leasing, conversion, or construction projects for temporary lodging facilities, regardless of scope and funded by non-appropriated fund activities will be forwarded for review and approval to Assistant Secretary of Defense (I&L).

**740 21      VISITOR'S RECEPTION CENTER (RECRUIT TRAINING ONLY) (SF)**  
**FAC: 7440**  
**BFR Required: Y**

74021-1      A visitor's reception center is limited to installations performing basic training. It serves as a point of contact between trainees and visiting relatives or friends. Approximate planning factor is 1.5 gross square feet per recruit.

74022-1      **NAVY**

Transient housing is Commander Naval Installations (CNIC)-operated living accommodations rented for a service charge to fleet personnel families of ships undergoing repair. This code is for inventory purposes only and is applicable only to housing units removed from the family housing inventory (Category Group 710) and designated for this purpose by the Chief of Naval Operations.

74022-2      **MARINE CORPS**

These quarters are operated primarily to provide a service to duty transient personnel and TAD students, and to conserve appropriated funds through reduced per diem payments. Guidance is provided in the Marine Corps Order P11000.22.

**740 23 COMMISSARY (INCLUDING BACK UP STORAGE) (SF)**  
**FAC: 7349**  
**BFR Required: Y**

74023-1 The Navy Commissary Systems were consolidated into the Defense Commissary Agency (DeCA) along with the other services on 1 October 1991. All Commissary construction planning, programming and execution has been transferred to that organization.

74023-2 Questions regarding Commissary construction plans, policies, procedures and sizing should be directed to the Defense Commissary Agency, Directorate of Facilities, Plans and Programs Division, Fort Lee Virginia, 23801-6300. Commercial telephone number is (804) 734-8000 ext. 4-8976.

**740 24 COMMISSARY COLD STORAGE (DETACHED) (SF)**  
**FAC: 4321**  
**BFR Required: Y**

74024-1 The Navy Commissary Systems were consolidated into the Defense Commissary Agency (DeCA) along with the other services on 1 October 1991. All Commissary construction planning, programming and execution has been transferred to that organization.

74024-2 Questions regarding Commissary construction plans, policies, procedures and sizing should be directed to the Defense Commissary Agency, Directorate of Facilities, Plans and Programs Division, Fort Lee Virginia, 23801-6300. Commercial telephone number is (804) 734-8000 ext. 4-8976.

**740 25 FAMILY SERVICES CENTER (SF)**  
**FAC: 7372**  
**BFR Required: Y**

Design Criteria: UFC 4-730-01 webpage: <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-4-730-01>

74025-1 **DEFINITION.** The Family Services Center (FSC) facility supports the programs that provide the information and family services necessary to support qualified single and married Department of Defense (DoD) personnel and their family members in meeting the unique demands of the military lifestyle, as defined by DoD Instruction 1342.22, Family Centers. The program and services provide information to DoD personnel and their family members, improve life skills by fostering competencies and coping skills, encourage self-sufficiency, and offer short-term support and assistance when necessary.

74025-2 **FAMILY SERVICE CENTERS (FSCs)** may be established as required to provide information and referral services, education and training services, and counseling services for the active duty population with services usable to dependents and retirees. The centers require open areas such as visiting rooms and conference areas with the majority of space allotted to individual offices conducive to execution of high quality and confidential service delivery.

74025-3 **SPACE ALLOWANCES.** They provide for baby/toddler play areas, waiting room, record storage, individual counselor offices, administrative areas, and storage areas for hospitality kit, general storage, conference rooms, staff areas, and classroom spaces for training exercises conducted by all FSCs.

74025-4 **LOCATION DETERMINENTS.** Several factors determine the most appropriate and cost effective location for a FSC.

74025-4.1 **Site Size.** Ensure adequate site space for the following elements when selecting the FSC site: criteria for parking space for customers and staff can be found in category code 852-10. Site must also meet Antiterrorism/Force Protection (AT/FP) set-back criteria.

74025-4.2 **Customer Access.** The FSC should be easily accessible both by Military personnel and by Military personnel family members and reservists. The importance of access by civilians or non-active duty personnel must not be overlooked. Consider locations such as near the Installation gate or other high-traffic areas such as the commissary, retail exchange, or medical facilities. As an alternative, consider locating the FSC off-installation like the Installation visitor's center or local high-traffic commercial/retail centers. If the FSC is located off-base, consider the AT/FP impacts to the design of the facility.

74025-4.3 **Capacity.** Capacity shall be determined by actual count of active duty and full time reserve military personnel receiving installation support who are entitled to FSC services. Overseas areas should include the number of DOD employees entitled to services. Justification remains the responsibility of the sponsoring command with requirements based on local needs. Adjust these figures for any projected increase/decrease in military population or mission changes. The population served by the FSC is determined by adding a multiplier to the active duty population. The multiplier varies depending on the location of the proposed FSC.

**CONUS:** FSC population equals active duty (AD) times **1.6**,

**OCONUS:** FSC population equals AD population times **2.4**, and

**Military (Fleet or Navy) Concentration Areas:** FSC population equals AD population times **2.4**.

74025-4.4 **New activities.** Determine the total number of active duty and full time reserve personnel receiving direct installation support.



**Table 74025-1  
Family Service Center Size Classifications**

Size Classification	Population Served
Small	500 to 3,000
Medium	3,001 to 10,000
Large	10,001 to 40,000
Extra Large	40,000 and Up

**Table 74025-2  
Family Service Center Gross Areas**

FSC	Gross Area (sq.m./SF)	Gross Area (sq.m./SF)	Estimated Staffing (PN)	Estimated Staffing (PN)
	Navy	Marine Corps	Navy	Marine Corps
Small	321.96 / 3,466	281.38 / 3,029	6-8	4-8
Medium	667.55 / 7,185	463.31 / 4,987	13-17	5-13
Large	1,160.29 / 12,489	813.14 / 8,753	19-26	6-19
Extra Large	1,763.39 / 18,981	1,310.78 / 14,109	31-36	12-31

Notes for Table 74025-2:

For full space program for the FSC small, medium, large, extra-large please see the UFC 4-730-01 at <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-4-730-01>

1. Many service agencies such as NADSAP, Navy-Marine Corps Relief, American Red Cross and CAA are collocated with FSCs. These areas are not a part of the Family Services Center and should not be counted against the requirements. For Red Cross see CC 740 12.
2. For populations fewer than 500, accommodate the FSC functions in other, non-dedicated facilities.

**740 26      INSTALLATION RESTAURANT (MWR) (SF)**

This CCN has been deleted. All existing assets should be reassigned to category code 740 04, Exchange Food Service / Restaurant.

**740 27      ARMED FORCES RADIO/TV STATION (SF)**  
**FAC: 1441**  
**BFR Required: Y**

74027-1      A radio and/or TV station is normally established in overseas locations to provide U.S. installation population with entertainment and news coverage. As a rule, the coverage radius is limited to the installation and immediate vicinity and the facilities are restricted for transmission of prerecorded program material, however if justified, limited studio facilities may be provided. At the present, no space criteria are available for this type of facility. Requirements must be developed on an individual basis.

**740 28      AMUSEMENT CENTER / RECREATION MALL (SF)**

This category code has been deleted. All existing assets are to be reassigned to category code 740 42 Community Recreation Center.

**740 30      EXCHANGE GAS/SERVICE AND AUTO REPAIR STATION (SF)**  
**FAC: 7345**  
**BFR Required: Y**

74030-1      Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535. See General Notes for NEX facilities at the beginning of the 740 Series.

74030-2      This facility provides space for gasoline and oil sales, automotive parts and accessories sales, emergency service and automotive repair service.

**740 31      POV FILLING STATION (OL)**  
**FAC: 1231**  
**BFR Required: Y**

74031-1      **DESCRIPTION.** This category code is for fueling stations associated with Personally Owned Vehicles (POVs) at an installation such as those associated with NEXCOM/MCCS facilities or similar.

**740 32      NEX CAR WASH BUILDING (SF)**  
**FAC: 7348**  
**BFR Required: Y**

74032-1      This facility is associated with the Navy Exchange (NEXCOM) for the washing of vehicles. The surrounding pavement is captured with either FAC 8521 –

Vehicle Parking, Surfaced or FAC 8526 – Miscellaneous Paved Area, depending on the particular situation of usage. For MWR car wash structures, use category code 740 33 - MWR Car Wash Structure.

74032-2 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535. See General Notes for NEX facilities at the beginning of the 740 Series.

74032-3 MWR facilities should be programmed through OPNAV N46 Deputy Base Ops and Support, (703) 695-5541.

**740 33 MWR CAR WASH STRUCTURE (SF)**

**FAC: 7350**

**BFR Required: Y**

74033-1 This structure is associated with MWR for the washing of vehicles. The footprint of the structure typically includes a mechanical room, a water separator, wash bays (both covered and uncovered), and pavement area. All other surrounding pavement is captured with either FAC 8521 – Vehicle Parking, Surfaced or FAC 8526 – Miscellaneous Paved Area depending on the particular situation of usage. For NEXCOM car wash buildings, use category code 740 32, NEX Car Wash Building.

74033-2 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head Planning Branch, 757-631-3535. See General Notes for NEX facilities at the beginning of the 740 Series.

74033-3 MWR facilities should be programmed through OPNAV N46 Deputy Base Ops and Support, (703) 695-5541.

**740 34 THRIFT SHOP (SF)**

**FAC: 7340**

**BFR Required: Y**

74034-1 This is a nonprofit facility for the sale and purchase by military personnel of used apparel, furnishings and equipment. See Table 74034-1 for space allowances.

**Table 74034-1. Space Allowances for Thrift Shops**

Military Strength	Gross SF
Up to 2,000	1,400

<b>Military Strength</b>	<b>Gross SF</b>
2,001 to 4,000	2,000
4,001 to 6,000	2,700
6,001 to 8,000	3,400
8,001 to 10,000	4,000
10,001 to 12,000	4,500
12,001 to 14,000	4,950
Over 14,000	5,350

**740 36 HOBBY SHOP – CRAFTECH (SF)****FAC: 7411****BFR Required: N**

This CCN is for inventory purposes only.

**740 37 MWR OUTDOOR RECREATION CENTER (SF)****FAC: 7446****BFR Required: Y**

Design Criteria: UFC 4-740-03

Design: Navy and Marine Corps Outdoor Adventure Centers and Rental Centers,

<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-4-740-03>

74037-1 **DEFINITION:** There are three categories of outdoor recreation centers included under this category code:

- Outdoor Adventure Centers (OAC),
- Rental Centers (RC), and
- Outdoor Centers & Other Rentals (OCOR).

Generally, these facilities rent and/or sell goods that are associated with Outdoor Recreation Programs (ORP) and other outdoor activities. There is a significant variety in the equipment and goods provided by each of these facility category types, however the general criteria and basic design approach for all three facility categories are similar. The three facility categories are described in paragraphs 74037-1.1, 74037-1.2 and 74037-1.3, and their respective missions are compared in Table 74037-1 with regard to equipment and programs.

74037-1.1 **Outdoor Adventure Centers (OAC)** provide human powered equipment which is specific to outdoor recreation and adventure activities. An OAC supports an Outdoor Recreation Program (ORP). The Marine Corps does not require that OAC or ORP operations be human powered. The activities offered take place in a natural area, front-country, backcountry, or wilderness environment. The name of the operation may reflect anything related to pursuits that fall within the respective Service's ORP. Of the three facilities, the OAC is

the preferred option within the Navy Morale Welfare and Recreation’s (MWR’s) Outdoor Recreation Program Master Plan.

74037-1.2 **Rental Centers (RC)** carry a variety of equipment unrelated to outdoor recreation but may also carry outdoor recreation equipment. Equipment from both categories may include trailers, boats, dunk tanks, home and garden tools, camping gear, athletic equipment, party items, catering items, rental trucks and trailers, etc. While and RC may rent and/or sell goods associated with outdoor and adventure activities, it does not support and ORP, and as such, it differs from and OAC or OCOR. Anything can be in the rental inventory that is appropriate and within the policies or local agreements, for example, agreements between Navy Exchange (NEX) and MWR. Instruction, repairs, and sales related to the equipment are appropriate. The name, image, and theme will be consistent with what is offered.

74037-1.3 **Outdoor Center and Other Rentals (OCOR)** facility is a combination of the first two categories and rents both home and garden type equipment and outdoor adventure activity type equipment that falls with the respective Service’s ORP. The two classifications of items must be physically and visually separated into their own unique areas of the facility. They are marketed separately and have specialized employees for each area. An OCOR also supports an Outdoor Recreation Program.

**Table 74037-1. Facility Types**

Facility Type	Equipment Offered	Support ORP
Outdoor Adventure Center (OAC)	OR	Yes
Rental Center (RC)	H&G and/or OR	No
Outdoor Center & Other Rentals (OCOR)	H&G and OR	Yes

OR= Outdoor Recreation equipment  
H&G= Home and Garden equipment/tools  
ORP = Outdoor Recreation Program

74037-2 **SIZE CLASSIFICATIONS** - The five facility size classifications and the typical active duty populations they serve are shown in Table 74037-2. The customer base is the primary size determinant. The active duty population directly relates to the potential customer base; however, the customer base may also include active duty family members, youth and teen program participants, and others. Consider all potential users when determining the customer base.

**Table 74037-2**  
**MWR Outdoor Recreation Center Facility Size Classifications**  
**and Active Duty Populations Served**

Size Classification	Active Duty Population Served	Total Building Gross Area	Total Site Support Area
Regional/Extra Large	Greater than 14,000	1,434 m2 / 15,440 ft2	1,060 m2 / 11,410 ft2
Large	7,001 – 14,000	871.59 m2 / 9,382 ft2	788.72 m2 / 8,490 ft2
Medium	3,001 – 7,000	651.39 m2 / 7,012 ft2	579.70 m2 / 6,240 ft2
Small	500 - -3,000	433.88 m2 / 4,670 ft2	373.46 m2 / 4,020 ft2
Extra Small	Less than 500	401.82 m2 / 4,325 ft2	373.46 m2 / 4,020 ft2

74037-3 **LOCATION DETERMINANTS.** Prior to initiating the facility planning of the OAC, RC, or OCOR, perform a space analysis of the existing Installation. This analysis should identify any existing functions which are programmatically considered an essential element of the ORP program. Following that analysis, consider the following factors to determine the location of the facility.

74037-3.1 **Overall Business Viability:** Business viability is the primary location determinant. A location favorable to sustaining a self-sufficient operation is needed. Patron access is one major component of business viability, but the entertainment and adventure elements of the facility must also be considered. The location should be attractive with proximity to natural areas and other retail or recreational services.

74037-3.2 **Existing Program Elements.** On some bases, existing program elements may be clustered in one area. Consider any existing program elements when locating the new facility to take advantage of the population's activity patterns, habits, and knowledge base. This will help with advertising the new facility. This determinant is more important in siting the OAC and OCOR facilities but should also be considered when site planning an RC.

74037-3.3 **Goods Access.** These facilities handle large and cumbersome goods and equipment. The site should offer easy access and room to maneuver the goods and equipment both for delivery and rental.

74037-3.4 **Patron Access.** The facility needs to be visible and easily accessible to the users. Consider locating near other high-visibility areas and related functions. This could be along the pedestrian paths to the existing barracks, existing MWR/NEX/MCCS facilities, and/or the dining facility. To accommodate moving equipment and quick patron access, provide adequate parking (per category code 852-10) as close as possible to the facility, taking into account Antiterrorism/Force Protection (ATFP) requirements.

**740 38 MWR AUTO SKILLS CENTER (SF)****FAC: 7412****BFR Required: Y**

SECNAV Approved Standards and Metrics are available for this CCN at <http://mwr.navy.mil/mwrprgms/programstand.htm>.

74038-1 **GENERAL.** See General Notes to 740 series category codes for General Instructions regarding facility allowance planning procedures.

74038-2 **DEFINITION.** The mission of Automotive Skills Center is to provide their customers with a quality, value-based program for the maintenance, repair, modification and improvement of their own vehicles including cars, trucks, trailers, motorcycles, and bicycles. Automotive Skills Centers are not full-service stations, but rather facilities where patron self-help is fostered and automotive skills are learned. Such facilities may also provide space for instructional programs, club meetings, administration, tool issuance, storage and parts sales.

74038-3 **RELATED FACILITIES.** Automotive Skills Centers may be collocated with complementary facilities such as self-service carwashes. Such collocations will have the advantage of drawing more patrons to a single location offering a wider assortment of services.

74038-4 **AUTO BAY DEMAND.** The primary functional component of an Automotive Skills Center is Auto Bays which are sized on the basis of the peak hour demand at each installation as follows:

74038-4.1 Use projected base loading data to determine the population for each significant population category, as listed in Table 74038-1.

74038-4.2 Calculate peak hour demand for Auto Bays by multiplying the population for each category by participation factors found in Table 74038-1. Add the demand for all population categories to derive peak hour Total Demand for Auto Bays.

74038-4.3 Apply the installation mission adjustment factor (divide by 2) for those bases with large numbers of personnel in training schools or on routine deployment.

74038-4.4 Determine the number of indoor or outdoor Auto Bays required to satisfy peak hour demand by dividing the Total Demand by the following capacities per bay per hour and rounding to the nearest whole unit:

- 1.5 users per indoor bay per hour
- 1.0 user per outdoor bay per hour

The split between indoor versus outdoor Auto Bays may be determined at the discretion of the local command. Facility planning considerations based on climatic factors are discussed below under section 4, Space Allowances.

**Table 74038-1. Auto Bay Demand Calculation**

Note	Population Category	Population (per Base Loading)	x	Participation Factor	=	Peak Hour Demand
(1), (2)	Enlisted	_____	x	0.0034	=	_____ users
(1), (2)	Officers	_____	x	0.0022	=	+ _____ users
(1), (2)	Retirees	_____	x	0.0004	=	+ _____ users
(1), (2)	Authorized Civilians	_____	x	0.0006	=	+ _____ users
<b>Total Demand (round to the nearest whole unit)</b>						_____ users
(3)	Divide by installation mission adjustment (for installations with more than 50 percent of their active-duty personnel in training schools or on routine deployment)					divide by 2.0
<b>Adjusted Total Demand (round to the nearest whole unit)</b>						_____ users
(4)	To calculate the number of Indoor Auto Bays divide by the capacity per auto bay					divide by 1.5
<b>Total Demand number of Indoor Auto Bays required to satisfy peak demand (round to the nearest even numbered whole unit)</b>						_____ bays
(4)	LOCAL OPTION: If Outdoor Auto Bays are locally desired, substitute 3 Outdoor Bays for every 2 Indoor Bays					

Notes for Demand Calculation -- Table 74038-1:

- (1) Population numbers should be consistent with projected base loading data. Officers are O-1 through O-10 and enlisted are E-1 through E-9. Civilians are authorized DoD employees. Retirees are all military retirees within a 30-minute drive of the installation.

For facility planning purposes at installations with deployable forces, the active duty demand population is comprised of all the non-deployable population, plus two-thirds of the deployable population, to reflect time away on deployment. However, calculation of the deployable population may be adjusted based on the actual deployment experience at individual installations.

- (2) Use of facilities by spouses and dependents has been statistically incorporated in the participation factors used in the tables. These participation factors may be revised periodically by NPC, and the most current figures must be used in all demand calculations.
- (3) Installation Mission Adjustment Factor  
 A factor that influences the use of an Automotive Skills Center is the type of installation and its particular mission. For example, Naval Stations have significant numbers of active-duty personnel routinely deployed, thereby losing potential patronage. Statistics show that even though the automobiles of active-duty personnel are routinely used by spouses and dependents during times of deployment, the skills center facilities are seldom used by these population groups. Likewise, naval installations which have a large percentage of their residents in training schools, with demanding study schedules, suffer declines in the use of Automotive Skills Center since those residents have fewer personally-owned vehicles and/or less leisure time. Therefore, if an installation has a large number of personnel in schools or on routine deployment -- greater than 50 percent of the active-duty population -- the total demand calculation derived in the steps indicated below in Table 74038-1 should be adjusted by dividing by 2.



- (4) The number of Indoor versus Outdoor Auto Bays may be determined by the local Command. If Outdoor Auto Bays are provided, they will substitute for Indoor Auto Bays at the rate of 3 Outdoor Bays for every 2 Indoor Bays.

**74038-5 SPACE ALLOWANCE.** The maximum space allowance for an Automotive Skills Center is determined according to the sizing criteria presented in Table 74038-2. For new construction projects, the actual size is determined through a Project Validation Assessment.

**74038-5.1** In warm climates, many skills center activities can be performed outdoors or under canopies. Outdoor Auto Bays may, therefore, be used to increase the total work space allowed for an auto skills center located in a warm climate. Such covered outdoor spaces, however, should be properly shielded from climatic conditions such as wind-driven rain or dust and sand.

**74038-5.2** Conversely, in very cold climates, care should be exercised with designs which are drafty, uncomfortable and difficult to heat because of the large number of vehicular openings. The number of vehicular openings may be minimized by adopting a layout more common in commercial garages, with interior circulation to auto bays. However, a facility with a limited number of vehicular entrances will require more interior space for maneuvering cars. In such circumstances, an economic analysis of the options is recommended. This analysis should balance the additional cost of constructing extra space for internal vehicular circulation against the reduced operating cost, the possible savings in perimeter walls, and the improved comfort and, therefore, potentially greater use by customers.

**74038-5.2.1** Full compliance with all applicable local, state and federal environmental regulations is required in the planning and development of Automotive Skills Centers at all naval installations. All facilities which have the potential for causing environmental contamination, such as, hydraulic lifts, oil tanks, drains, etc. must be appropriately designed with adequate safeguards. Furthermore, to avoid problems related to the safety of patrons and staff, provision of paint booths is not recommended; however one may be provided if the local installation and patrons agree. The paint booth must be capable of receiving required environmental permits. In many areas of the country, new permits are not being issued in non-attainment areas.

**Table 74038-2. Space Allowance for Auto Skills Center**

Note	Table	Functional Component	# Units	x	Space Allocation Factor	=	Total NSF	Minimum or Maximum NSF
<b>ACTIVITY AREAS</b>								
(1)	740 38A	Auto Stalls/Bays	___	X	300 NSF per bay	=	___	
		Machine Shop Workbenches (@ one bench per bay)	___	X	65 NSF per bench	=	+ ___	
		Welding Area			25% total NSF for workbenches	=	+ ___	
		Engine Cages (@ one cage per bay)	___	X	40 NSF per cage	=	+ ___	
		Resale/Tool Issue		X	30 NSF per bay	=	+ ___	
		Classroom Teaching Area	___	X	15 NSF per seat	=	+ ___	225 min./ 450 max.
		Storage Area		X	25% total NSF for classroom	=	+ ___	
Subtotal Activity Areas (Net Square Feet)						=	_____	
<b>ACTIVITY SUPPORT</b>								
		Customer Lounge			15% total NSF workbenches	=	___	40 min.
		Patron Support (including lockers, toilets, vending machines)			7-14% X subtotal Activity Areas	=	+ ___	300 min.
		Administration			12-16% X subtotal Activity Areas	=	+ ___	285 min.
Subtotal Activity Support (Net Square Feet)						=	_____	
<b>BUILDING SUPPORT</b>								
		Entrance/Lobby/Circulation/ Housekeeping Supplies/Janitor's Closet/ Structure/Partitions			13-17% X subtotal Activity Areas + subtotal Activity Support Areas	=	___	
		Mechanical/Electrical/ Communication Equipment Space			9-13% X subtotal Activity Areas + subtotal Activity Support Areas	=	+ ___	
TOTAL FACILITY ALLOWANCE (Gross Square Feet)						=	_____	

Notes for Space Allowance -- Table 74038-2:

- (1) 300 NSF per auto bay is an average figure. Actual bay sizes may vary, ranging from typically, 288 NSF for muffler/tire/lubrication bays to 336 NSF for general repair/bodywork/steam cleaning bays.

NSF = Net Square Feet

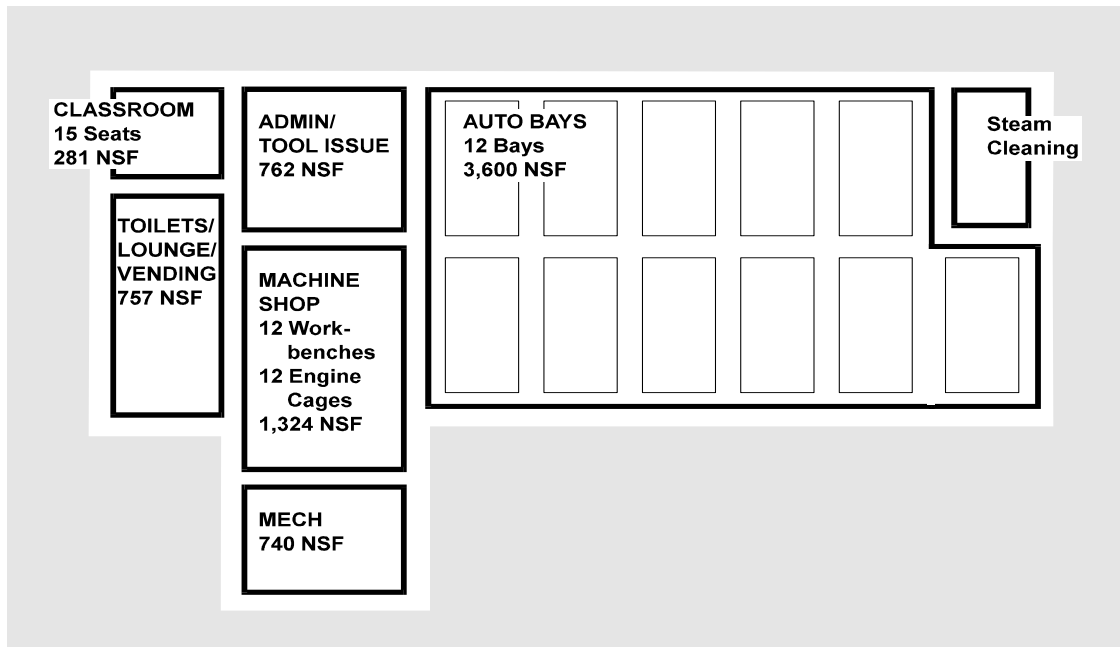
GSF = Gross Square Feet

Minimum or Maximum NSF = Minimum or maximum space allowance to be provided for the particular function or activity.

74038-5 **SAMPLE LAYOUT DIAGRAM.** A layout diagram is presented for a medium size Automotive Skills Center. This diagram is an example of the composition

of such a facility in terms of its functional components, their respective sizes and adjacencies. The layout diagram is for illustrative purposes only.

**Figure 74038-1**  
**Layout Diagram – Automotive Hobby Shop, Medium Size Facility**



**740 40 BOWLING CENTER (SF)**  
**FAC: 7415**  
**BFR Required: Y**

SECNAV Approved Standards and Metrics are available for this CCN at <http://mwr.navy.mil/mwrprgms/programstand.htm>

74040-1 **GENERAL.** See General Notes to 740 series category codes for General Instructions regarding facility allowance planning procedures.

74040-2 **DEFINITION.** Bowling Centers are recreational facilities which accommodate bowling and related functions, which may include: open bowling, leagues, tournaments, youth bowling, instruction, exhibitions, and support activities such as equipment sales and rental, food and beverage service, electronic and table games, and meetings.

74040-3 **RELATED FACILITIES.** Consideration should be given to collocating the Bowling Center with the following recreational facilities in order to (i) take advantage of

potential savings in space requirements and operating costs, and (ii) provide users with the increased convenience of clustered facilities:

- 740 42 Community Recreation Center
- MWR recreational and foodservice facilities, generally

74040-4 **BOWLING DEMAND.** The number of bowling lanes required in a Bowling Center is based on the usage demand at each installation, as follows:

74040-4.1 Use projected base loading data to determine the population for each significant population category, as listed in Table 74040-1.

74040-4.2 Calculate the annual bowling lineage demand by multiplying the population for each category by participation factors drawn from the installation's most recent demand survey, and by adjustment factors as indicated in Table 74040-1.

74040-4.3 Find the number of lanes required to accommodate the bowling lineage demand in Table 74040-2. These allowances are based on the minimum number of lines required to generate sufficient revenues to meet standard operating expenses.

74040-4.4 Calculate the capacity requirements for foodservice and games components by multiplying the numbers of bowling lanes and of projected non-bowling patrons by the usage factors in Tables 74040-3 through 74040-7. See Section 5, below, for explanation of these Tables.

74040-4.5 Multiply the number of units required for each functional component by the space allocation factors in Table 74040-8. Add the net square footage (NSF) for all components and add support area factors as directed in Table 74040-8, to derive the Total Facility Allowance.

\* For **Marine Corps Installations** use historical patron data to determine the participation factor.

**Table 74040-1. Bowling Linage Demand Calculation**

Note	Population Category	Population (per Base Loading)	x	Participation Factor	x	Adjustment Factor	=	Lines Bowled per Year	
(1), (2), (3)	Officers	_____	x	___ %	x	111	=	_____	
(1), (2), (3)	Enlisted	_____	x	___ %	x	17	=	+ _____	
(1), (2), (3)	Retirees	_____	x	___ %	x	31	=	+ _____	
(1), (2), (3)	Family Members	_____	x	___ %	x		=	+ _____	
(1), (2), (3)	DoD Civilians	_____	x	___ %	x		=	+ _____	
<b>Total Lines Bowled per Year</b>							=		
(4)	Add lineage for installations in locations with harsh or long winter							=	+ 32,500
<b>Adjusted Total Linage Demand</b>							=	_____	

Notes for Bowling Linage Demand Calculation:

- (1) Population numbers should be consistent with projected base loading data. Officers are O-1 through O-10 and enlisted are E-1 through E-9. Retirees are all military retirees within a 30-minute drive of the installation.  
For facility planning purposes at installations with deployable forces, the active duty demand population is comprised of all of the non-deployable population, plus two-thirds of the deployable population, to reflect time away on deployment. However, calculation of the deployable population may be adjusted based on the actual deployment experience at individual installations.
- (2) The adjustment factors modify lineage demand to reflect differential usage patterns among the different user population categories.
- (3) Linage demand for installations in locations with harsh or long winters is adjusted by adding an extra 32,500 lines to the total number of lines bowled per year. This includes all installations located in the following states: Alaska, Colorado, Connecticut, Delaware, Idaho, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming and the District of Columbia.

**Table 74040-2. Lane Allowances for Bowling Centers**

Note	Lines Bowled per Year	Number of Lanes Authorized CONUS	Number of Lanes Authorized OCONUS
	Fewer than 10,000	0	0
(1)	10,000 - 18,000	2	2
(1)	18,001 - 36,000	4	4
(1)	36,001 - 54,000	6	6
(1)	54,001 - 69,120	8	8
(1)	69,121 - 86,400	10	10
(1)	86,401 - 107,640	12	12
	107,641 - 124,200	14	18
	124,201 - 140,760	16	20

<i>Note</i>	Lines Bowled per Year	Number of Lanes Authorized CONUS	Number of Lanes Authorized OCONUS
	140,761 - 165,600	18	24
	165,601 - 231,840	24	32
	231,841 - 298,080	32	40
	298,081 - 364,320	40	50
	Each incremental increase of 17,280	additional 2	additional 2

Note for Bowling Lane Allowances:

- (1) Bowling Centers with 12 lanes or fewer are generally considered uneconomic to operate. Centers of such size can only be approved in exceptional cases, with substantial justification of economic viability.

74040-5 **DEMAND FOR FOODSERVICE AND GAMES.** The numbers of seats in the snack bar and lounge and the numbers of video games and pool/billiards tables required in the Bowling Center should represent the sum of the demand from both bowling patrons and other users -- guests, spectators, and patrons primarily using the food service or games areas of the center. The size of the non-bowling clientele will depend on such local installation factors as the location of the facility, proximity of potential patron populations, competing food service and amusement center facilities, type and attractiveness of food service and games program operations, and historic usage patterns.

74040-5.1 Demand for meeting/function room space must be based on other users than bowling patrons. The seat capacity requirement should be based on the type and size of specific functions for which there is a justifiable local demand.

74040-5.2 Tables 74040-3 through 74040-7 provide usage factors for calculating the demand for the functional components in the foodservice and games areas.

Notes for Foodservice and Games Demand Calculation - Tables 74040-3 through 74040-7:

- (1) Use number of bowling lanes as derived in Table 74040-2.
- (2) The projected number of non-bowling patrons for each functional component must be determined by the installation and justified based on analysis of specific local experience and requirements. In the absence of local installation data, assume that the numbers of seats required for non-bowling patrons in the foodservice areas, and the numbers of machines and tables for non-bowling patrons in the games area, are equal to those calculated for the bowling patrons.

**Table 74040-3. Snack Bar Demand Calculation**

Note	# Demand Units	x	Usage Factor	=	Peak Demand
(1)	___ Bowling Lanes	x	0.50 seats per lane	=	___ seats
(2)	___ Non-Bowling Patrons per Peak Hour	x	0.25 seat-hours per patron	=	+ ___ seats
Total Demand (round to the nearest whole unit)					= ___ seats

**Table 74040-4. Lounge Demand Calculation**

Note	# Demand Units	x	Usage Factor	=	Peak Demand
(1)	___ Bowling Lanes	x	0.44 seats per lane	=	___ seats
(2)	___ Non-Bowling Patrons per Peak Hour	x	0.50 seat-hours per patron	=	+ ___ seats
Total Demand (round to the nearest whole unit)					= ___ seats

**Table 74040-5. Combined Snack Bar/Lounge Demand Calculation**

Note	# Demand Units	x	Usage Factor	=	Peak Demand
(1)	___ Bowling Lanes	x	0.72 seats per lane	=	___ seats
(2)	___ Non-Bowling Patrons per Peak Hour	x	0.33 seat-hours per patron	=	+ ___ seats
Total Demand (round to the nearest whole unit)					= ___ seats

**Table 74040-6. Video Games Demand Calculation**

Note	# Demand Units	x	Usage Factor	=	Peak Demand
(1)	___ Bowling Lanes	x	1.0 machines per lane	=	___ machines
(2)	___ Non-Bowling Patrons per Peak Hour	x	1.0 machine-hours per patron	=	+ ___ machines
Total Demand (round to the nearest whole unit)					= ___ machines

**Table 74040-7. Pool/Billiards Demand Calculation**

Note	# Demand Units	x	Usage Factor	=	Peak Demand
(1)	___ Bowling Lanes	x	0.22 machines per lane	=	___ tables
(2)	___ Non-Bowling Patrons per Peak Hour	x	0.20 table-hours per patron	=	+ ___ tables
Total Demand (round to the nearest whole unit)					= ___ tables

74040-6 **SPACE ALLOWANCES.** Space allowances for Bowling Centers are determined according to the planning criteria presented in Table 74040-8 below. The total allowance for a facility is the sum total of the space allowances for each functional component. The number of units of each component required to meet the demand is obtained from the calculations in Tables 74040-1 through 74040-7.

**Table 74040-8. Space Allowances for Bowling Centers**

Note	Table	Functional Component	# Units	x	Space Allocation Factor	=	Total NSF	Minimum or Maximum NSF
		<b>ACTIVITY AREAS</b>						
		Bowling						
	A, B	Bowling Lanes (incl. pin spotting, settee, promenade, lockers)	___	x	650 NSF per lane	=	___	
	A, B	Workroom	___	x	70 NSF per lane	=	+___	120 NSF min. 840 NSF max.
		<b>Food Service</b>						
	C	Snack Bar (incl. seating, kitchen, serving counter, storage)	___	x	27 NSF per lane	=	+___	
	D	Lounge (incl. seating, bar, storage)	___	x	20 NSF per lane	=	+___	
(1)	E	Combined Snack Bar/Lounge (incl. seating, kitchen, serving counter, bar, storage)	___	x	25 NSF per lane	=	+___	
(2)		Meeting/Function Room	___	x	12 NSF per lane	=	+___	
		<b>Games</b>						
		Video Games	___	x	30 NSF per lane	=	+___	
		Pool/Billiards	___	x	370 NSF per lane	=	+___	
		<b>Subtotal Activity Areas</b>				=	+___	
		<b>ACTIVITY SUPPORT AREAS</b>						
		Toilets	3% x Subtotal Activity Areas			=	+___	
		Administration (incl. pro shop, control counter, storage)	3% x Subtotal Activity Areas			=	+___	1,000 NSF max.
		<b>Subtotal Activity Support Areas</b>				=	+___	
		<b>BUILDING SUPPORT AREAS</b>						
(3)		Lobby/Circulation/Structure/Partitions/Janitor	4-5% x (Subtotal Activity Areas + Subtotal Activity Support Areas)			=	+___	
		Mechanical/Electrical/Communication Equip. Space	5-10 % x (Subtotal Activity Areas + Subtotal Activity Support Areas)			=	+___	
		<b>TOTAL FACILITY ALLOWANCE</b>				=	___	GSF

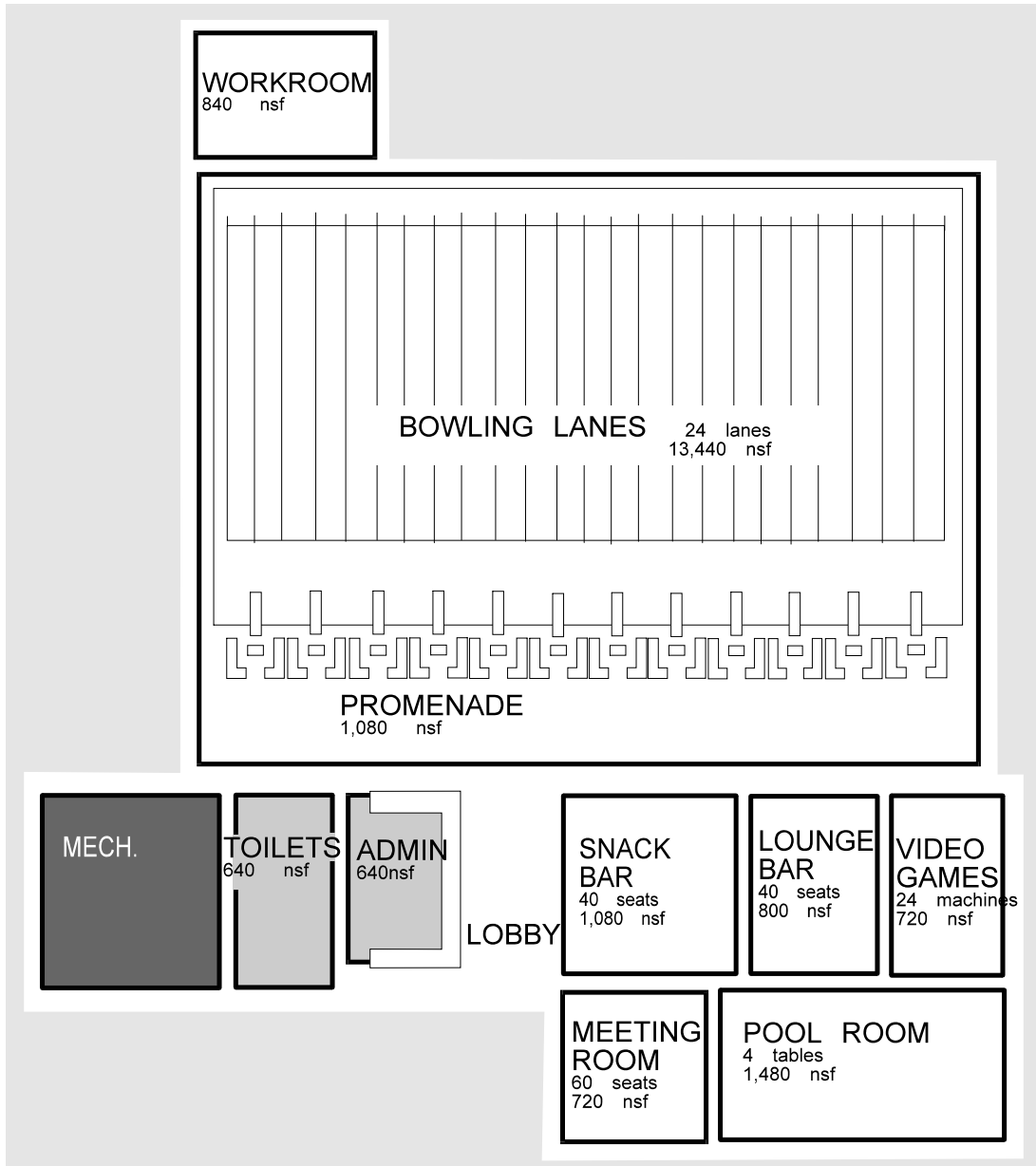
Notes for Space Allowance Table:

- (1) Combined snack bar/lounge may be provided as an alternative to separate snack bar and lounge spaces.
  - (2) Meeting/function room seating capacity should be based on usage by other than bowling patrons. Usage projection must be justified by demand and economic operations analysis, serving local function requirements.
  - (3) Lobby/circulation/structure/partitions/janitor area -- use 5% factor for centers of 24 lanes or less; 4% for 26 lanes or more.
- NSF = Net Square Feet  
 GSF = Gross Square Feet  
 Minimum or Maximum NSF = Minimum or maximum space allowance to be provided for the particular function or activity.



74040-7 **SAMPLE LAYOUT DIAGRAM.** A layout diagram is presented for a medium-size Bowling Center. This diagram is an example of the composition of such a facility in terms of its functional components, their respective sizes and adjacencies. The layout diagram is for illustrative purposes only.

**Figure 74040-1. Bowling Center – Medium Capacity**



**740 42 COMMUNITY RECREATION CENTER (SF)**  
**FAC: 7417**  
**BFR Required: Y**

SECNAV Approved Standards and Metrics are available for this CCN at  
<http://mwr.navy.mil/mwrprgms/programstand.htm>

74042-1 **GENERAL.** See General Notes to 740 series category codes for general instructions regarding facility allowance planning procedures.

74042-2 **DEFINITION.** The primary customer for the Community Recreation Center is the ship-based sailor, primarily younger (ages 18-24) enlisted personnel (mostly E1-E6). The mission of a Community Recreation Center is to support fleet readiness and enhance the morale of sailors through a professionally staffed, customer-oriented recreation program that serves the leisure needs of Fleet sailors. The Recreation Center is not for family use, but is intended for active duty personnel. A typical Community Recreation Center is located within convenient walking distance (5-10 minutes) of the piers where Navy vessels are berthed, and should be conveniently located within a 5-10 minute walking radius of the majority of BEQ's. Activities accommodated in Community Recreation Centers include: "hanging out", informal group activities, sports, parties, contests, tournaments, intra-ship competitions, special events, theme activities for holidays, music practice and "jam" sessions, talent shows, movie marathons, game show nights, demonstrations, classes, lectures, board games, card games, television, trivia contests and special programs for women, and other programs structured to meet the special needs of Fleet sailors. Some basic services such as vending and snack bars, laundromats and telephone banks, individual private telephone booths with seats (supervised by a cashier/control desk, and limited space for waiting) may be included for the convenience of patrons.

The local Command has the option of providing the total space allowance as one Recreation Center or distributing the square footage among several smaller facilities. The latter approach may be appropriate on larger bases with multiple concentrations of E1-E6 residential populations.

At installations with smaller populations, Rec. Center functions may be accommodated in a Community Center which serves both younger single sailors and older personnel with families. Facility planning criteria for Community Centers are addressed separately under Category Code 714 32.

Each location where a Navy fleet is based should be individually analyzed to understand its specific situation, and determine the mix of Community Recreation Center functions most appropriate to meet local needs. The space allowance should be based on the development of a justifiable program of functions, capacities and sizes, comparable to the Sample Space Programs contained in this criteria section.

74042-3 **RELATED FACILITIES.** Consideration should be given to collocating Community Recreation Centers with related facilities in order to (i) take advantage of

potential savings in space requirements and operating costs (for example, consolidation of administrative and support spaces, site development and staffing), and (ii) provide users with the increased convenience of a clustered recreation complex. These related facilities include:

- 740 40 Bowling Center
- 740 44 Indoor Physical Fitness Center
- 740 53 Swimming Pool
- 740 64 Enlisted Mess, Open.
- Foodservice facilities such as Clubs
- Other MWR indoor and outdoor recreational facilities.

74042-4 **SPACE ALLOWANCE.** The maximum facility allowance for Community Recreation Centers is according to sizing criteria presented in Table 74042-1. The maximum gross square footage indicated in the table is the maximum total allowance per base, and may be used for a single large complex or multiple facilities.

**Table 74042-1. Space Allowances for Community Recreation Centers**

Ship-based Population (rounded to the nearest thousand)	Max. Gross Square Feet (total allowance per base)	Note
less than 1,500	0 GSF	(1), (2), (3)
2,000 to 5,000	6,600 GSF	(2), (3)
6,000 to 15,000	15,500 GSF	(2), (3)
16,000 and over	31,000 GSF	(2), (3), (4)

Notes for Table 74042-1:

- (1) For installations with a ship-based population of 1,500 or less, the base Gymnasium, Bowling Center, Community Center, and other MWR facilities may serve the fleet sailor's recreational needs in lieu of a Community Recreation Center.
- (2) Population numbers should be consistent with projected base loading data. For facility planning purposes at installations with deployable forces, the active duty demand population is comprised of all the non-deployable population, plus two-thirds of the deployable population, to reflect time away on deployment. However, calculation of the deployable population may be adjusted based on the actual deployment experience at individual installations.
- (3) Round-off population up or down to the nearest thousand.
- (4) For extra-large installations, the space allowance should be split up into a minimum of two facilities at separate sites conveniently located within proximity to ship-based population concentrations.

74042-5 **SAMPLE LAYOUT DIAGRAMS.** Layout diagrams are presented for a medium and large size Community Recreation Center. The diagrams are an example of the composition of such a facilities in terms of their functional components, and their respective sizes and adjacencies. The layout diagrams are for illustrative purposes only.

Figure 74042-1. Community Recreation Center – Medium Size Facility

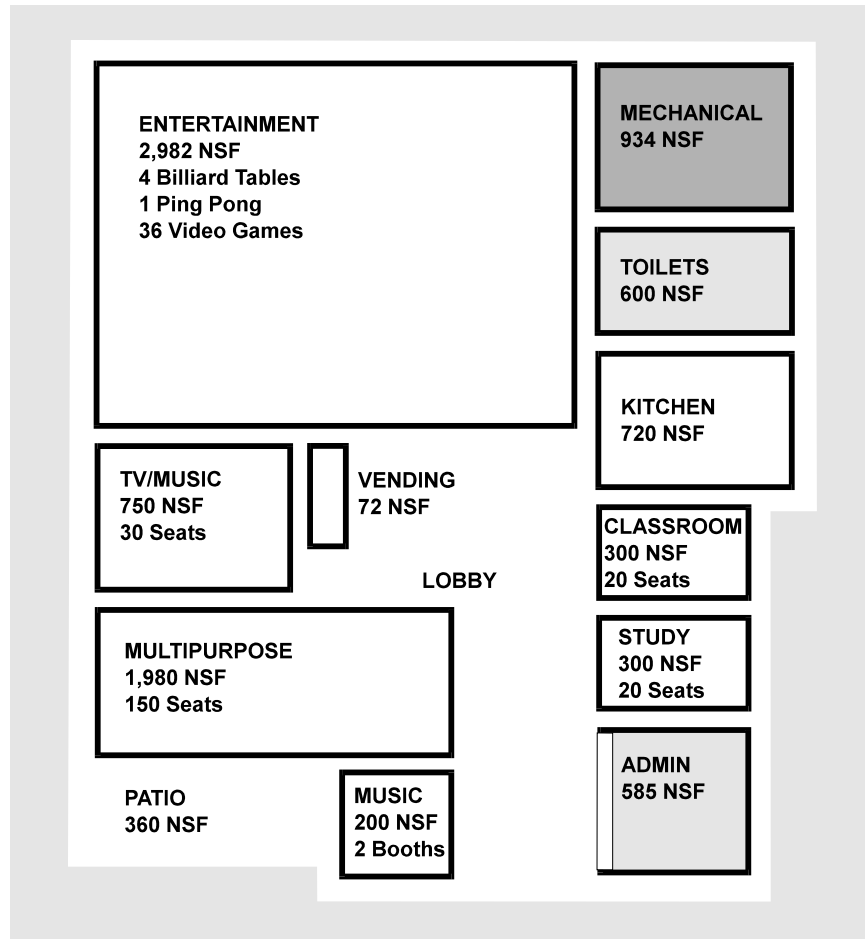
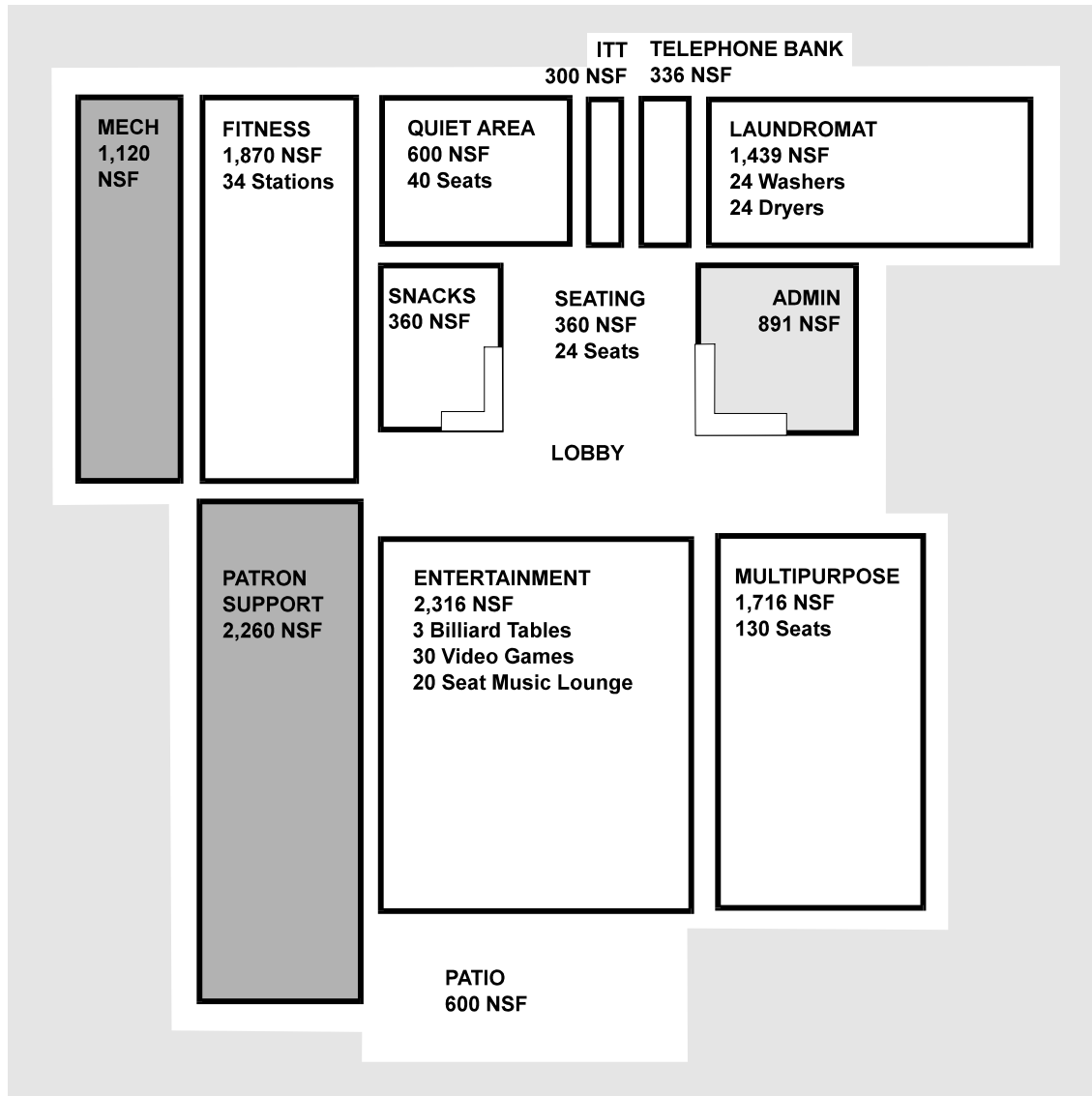


Figure 74042-2. Community Recreation Center – Large Size Facility



**740 44 INDOOR PHYSICAL FITNESS CENTER (GYM) (SF)**  
**FAC: 7421**  
**BFR Required: Y**

SECNAV-approved Fitness Standards and Metrics are available at [http://www.navyfitness.org/fitness/fitness\\_standards\\_and\\_metrics/](http://www.navyfitness.org/fitness/fitness_standards_and_metrics/)

- Facility design criteria is available in FC 4-740-02, "Fitness Centers" at <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-4-740-02>

74044-1 **GENERAL.** Refer to the introductory material in 740-1, 740-2 and 740-3 found at the beginning of the 740 series category codes for general instructions regarding facility allowance planning procedures. Also, potential loading data sources are discussed in Chapter 1 of this criteria manual.

74044-2 **DEFINITION.** Physical fitness facilities provide facilities and support services to meet the individual physical fitness, coordination, skills development, and recreation and training needs of military personnel. Depending on the geographic location of the Installation, the facilities may also allow usage by family members, retirees and authorized civilians (refer to paragraph 74044-4.1).

Activities which may be accommodated in a facility include: aerobics, athletic gear issue, badminton, basketball, boxing, calisthenics, cardiovascular training, gymnastics, handball, jogging, martial arts, physical fitness training, racquetball, volleyball, Wally ball, weight-training, wrestling, group meetings, etc.

74044-3 **RELATED FACILITIES.** Consideration should be given to co-locating the facility with the following recreational facilities in order to: (1) take advantage of potential savings in space requirements and operating costs, and (2) provide users with the increased convenience of clustered facilities:

- 740 53 Indoor Swimming Pool
- 750 10 Outdoor Playing Courts
- 750 20 Playing Fields
- 750 30 Outdoor Swimming Pool.

74044-4 **SPACE ALLOWANCE.** The primary functional components of an Indoor Fitness Facility—Basketball Court, Aerobics/Exercise Area, Cardiovascular Training Area, Weight Training Area, and Indoor Playing Court—are sized based on installation population. Installation population ranges are as follows:

XSMALL	=	Population 0 - 500
SMALL	=	Population 501 - 3,000
MEDIUM	=	Population 3,001 - 7,000
LARGE	=	Population 7,001 - 14,000
XLARGE	=	Population 14,001 - 30,000
JUMBO	=	Population greater than 30,000

74044-4.1 Installation population is defined as Active Duty enlisted and officers, average on board students, transients, and reservists (see introductory paragraph 740-2.2.4). For overseas locations, include authorized civilians and family members in the installation population total. Population numbers should be consistent with projected base loading data.

74044-4.2 For facility planning purposes at installations with deployable forces, the active duty demand population is comprised of all the non-deployable population, plus two-thirds of the deployable population, to reflect time away on deployment. However, calculation of the deployable population may be adjusted based on the actual deployment experience at individual installations.

74044-4.3 Based on the calculated installation population size, determine the authorized facility space allowance from the interactive Fitness Space Program spreadsheet referred to in paragraph 74044-5.

74044-4.4 Space allowances developed from the spreadsheet are minimum allowances. For areas with large concentrations of military population, actual facility usage data may be used to justify additional space.

74044-4.5 Usage of stateside facilities by family members and retirees has been statistically incorporated in the space allowances used in the spreadsheet. These allowances are reviewed periodically by NAVFAC HQ, BUPERS, and CMC.

74044-4.6 **MARINE CORPS INSTALLATIONS ONLY:** For installations with a population exceeding 3,000 personnel, determine the fitness area space requirements as follows:

- (a) Peak Load = 3.5% of installation population
- (b) Fitness Area = 4.21 sq.m. (45.32 SF) per patron at peak load

*Example: 6,000 population x 0.035 = 210 patrons at peak load.*

*210 patrons x 4.21 sq.m. (45.32 SF) = 884 sq.m. (9,517 SF)*

For the purposes of this formula, the fitness areas include only the free weight, other resistance weight training equipment, and cardiovascular equipment areas and do not include space for stretching/warm-up/cool-down and the fitness assessment office.

74044-5 **SPACE PLANNING SPREADSHEET.** Minimum space allowances for Indoor Physical Fitness Centers are determined according to the planning criteria incorporated into the Fitness Space Program Spreadsheet, which can be found at <https://www.wbdg.org/ffc/dod/unified-facilities-space-program-sustainability-spreadsheets>.

The total allowance for the planned facility is shown as the sum total of the space allowances for each functional component. The number of units of each component required to meet the demand is obtained from the calculations associated with the installation population.

74044-5.1 Spectator seating (minimum capacity 200 for a small facility, maximum capacity 600 for a large facility) should be provided in the basketball court at 0.4 sq. m. (4.3 NSF) per person. The seating capacity should be justified by the use of the court for activities drawing significant numbers of spectators. Portable or telescopic bleachers may be used.

74044-5.2 Fitness area includes warm up/cool down area, free weights, circuit/weight training machines, and cardiovascular equipment (bicycle, stepper, and rower). Space for one Instructor station should be included in each separate Weight Training Area.

74044-5.3 Staff support spaces consist of:

- (a) Control Counter and Administrative Area.
- (b) Gear Issue and Laundry Room: Check out of athletic gear and recreation equipment for leisure use.
- (c) Gym Equipment Storage Room: Equipment and supplies, such as roll-away baskets goals, volleyball standards, and gym floor coverings, roll-away bleachers, etc.

**740 45 FITNESS ROOM (SF)**

**FAC: 7421**

**BFR Required: N**

74045-1 **DESCRIPTION** Fitness Rooms are stand-alone, unsupervised gym facilities, usually containing cardio equipment and weight machines or free weights, in a single room or small group of rooms within a facility which is classified under a different CCN.

74045-2 **REQUIREMENT** This CCN is primarily for inventory purposes, and the quantity of "fitness rooms" at an installation should be considered when planning new facilities under CCN 740-44.

74045-3 **GUIDANCE** Refer to Commander, Navy Installations Command (CNIC) Instruction 1710.1 dated August 1, 2011 for policy and guidance concerning the operation of unmanned fitness spaces.

**740 46 ROLLER/ICE SKATING RINK (SF)**

**FAC: 7418**

**BFR Required: N**

74046-1 This category code is for inventory only and is no longer approved for new construction.



**Table 74046-1**  
**Space criteria for Roller/ice skating rinks**

Military Strength (1)	Gross SF
Up to 2,000	10,000 note (2)
2,001 to 20,000	15,000 note (3)
20,001 and up	20,000 note (3)

Gross area is exclusive of mechanical room space.

- (1) Military strength is defined as military population plus 50% of the dependent personnel.
- (2) Plus additional space for support functions.
- (3) Includes space for support functions.

**740 47 INFORMATION, TICKETS AND TRAVEL OFFICE (SF)**  
**FAC: 7446**  
**BFR Required: Y**

SECNAV Approved Standards and Metrics are available for this CCN at  
<http://mwr.navy.mil/mwrprgms/programstand.htm>

74047-1 **GENERAL.** See General Notes to 740 series category codes for General Instructions regarding facility allowance planning procedures.

74047-2 **DEFINITION.** The mission of the Recreation Information, Tickets and Travel (ITT) Office is to serve the military community's leisure needs by providing information on what to see and do locally, offering tours to nearby attractions, selling tickets for musical and theatrical performances, concerts, sporting and other special events, and providing options for Leisure Travel (this may include cruise and airline ticket service).

ITT facilities can vary according to local needs, and may range from ticket selling booths and information counters to travel agency type accommodation with display and office desk/seating/waiting area configurations.

74047-3 **RELATED FACILITIES.** ITT operations may benefit from collocation with high traffic uses such as Base Exchanges.

74047-4 **SPACE ALLOWANCE.** The space allowance for ITT Offices is presented below in Table 74047-2.

74047-4.1 The number and appeal of local attractions and recreational opportunities will have a direct impact on the volume of ticket sales and information requests handled by an ITT Office. This volume is the primary determinant of the number of staff required to serve the market at individual

bases. Based on analysis of existing operations, the staffing ratio indicated in Table 74047-1 is recommended.

**Table 74047-1. Recommended Staffing For ITT Office**

Active-Duty Installation Population	Full-Time Staff	Part-Time Staff	Note
250 or less	0	2	(1)
251-1,000	1	1	(1)
1,001-5,000	1	2	(1)
5,001-10,000	3	3	(1)
more than 10,000	3	4	(1)

Note for Staffing Table:

- (1) Population numbers should be consistent with projected base loading data. For facility planning purposes at installations with deployable forces, the active-duty demand population is comprised of all of the non-deployable population, plus two-thirds of the deployable population, to reflect time away on deployment. However, calculation of the deployable population may be adjusted based on the actual deployment experience at individual installations.

**Table 74047-2. Space Allowance for ITT Office**

# Staff	Min. Gross Square Feet (rounded up to the next FTE)	Max. Gross Square Feet
1	200 GSF	450 GSF
2	300 GSF	720 GSF
3	500 GSF	990 GSF
4	840 GSF	1,210 GSF
5	1,100 GSF	1,410 GSF

Note for Space Allowance Table:

FTE = Full Time Equivalent, in situations where staffing is made up of full- and part-time employees.

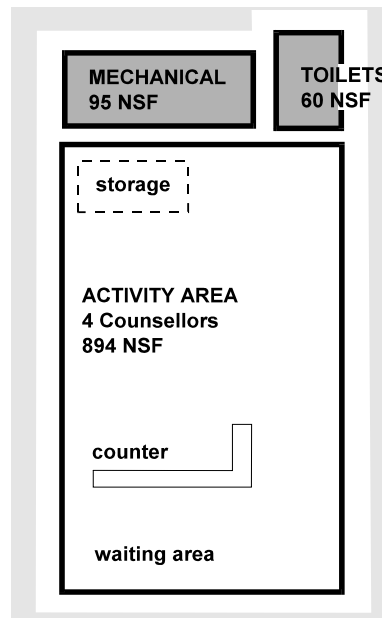
74047-4.2 A good location is critical for running a successful ITT operation -- offices should be located in convenient, high visibility locations. Adequate parking should be available near the office per category code 852-10.

74047-4.3 Ticket booths may be located separately from other ITT facilities. On large bases requiring multiple booths, such booths may be clustered in one location or occupy several sites. When siting ticket booths, space for lines to form should be taken into account. Booth locations should allow for long lines to spill over into adjacent parking lots on those occasions when tickets for events drawing large audiences go on sale.

74047-5 **SAMPLE LAYOUT DIAGRAM.** A layout diagram is presented for an extra-large size ITT Office. This diagram is an example of the composition of such a facility in

terms of its functional components, their respective sizes and adjacencies. The layout diagram is for illustrative purposes only.

**Figure 74047-1. ITT Office – Extra Large Size Facility**



**740 49 AUSTERE INDOOR PHYSICAL FITNESS CENTER (GYM) (SF)**

Facility planning criteria related to Austere Indoor Physical Fitness Centers can be found in FC 2-000-05N - Appendix F "Austere Facilities (Navy)," located at [https://www.wbdg.org/FFC/DOD/UFC/fc\\_2\\_000\\_05n\\_appendixf.pdf](https://www.wbdg.org/FFC/DOD/UFC/fc_2_000_05n_appendixf.pdf).

**740 52 GUN, SKEET AND/OR TRAP BUILDING (SF)**

**This CCN has been deleted. All existing assets should be reassigned to CCN 74090 Recreational Support Building.**

**740 53 SWIMMING POOL - INDOOR (INCLUDING POOLSIDE DECK) (SF)**

**FAC: 7422**

**BFR Required: Y**

74053-1 **GENERAL.** See General Notes to 740 series category codes for General Instructions regarding facility allowance planning procedures.

The planning criteria presented below for Category Code 740 53 are also applicable to Category Code 750 30, Outdoor Swimming Pool -- Installation.

74053-2 **DEFINITION.** The primary purpose of Swimming Pools is to support physical readiness programs as well as instructional, informal and intramural activities, and to serve the recreational needs of active-duty military personnel and their spouses and children, retirees and DoD authorized civilians. Note that pools with training and fitness missions are funded as MILCON and purely recreational pools are funded as NAFCON. With the exception of extra-small and small bases, each installation must provide either an all-hands indoor or outdoor pool, or access to aquatic resources in the local community to meet patron recreational demands. All on-base aquatics facilities must be ADAAG/ABA compliant.

74053-2.1 The local Command has discretion over the decision to provide indoor or outdoor Swimming Pools. However, in general, large installations requiring more than one Swimming Pool to meet patron demand, may develop only one indoor pool. The Navy Fitness Program Manager (CNIC N-9) strongly supports an indoor pool collocated with the Fitness Center for all Medium and larger installations to support fitness swimming for Navy Physical Readiness Testing. Additional indoor pools may be developed on the basis of facility planning criteria specified for Combat Training Pool/Tank under category code 179 55.

74053-2.2 In addition to the swimming pool, special features such as diving wells, water slides and wading pools (refer to relevant UFC criteria at <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc> and zero-depth entry areas may be incorporated in the facility if there is sufficient local justification.

74053-2.3 At smaller installations, the potential for shared use of a single pool for both recreational and training needs should be examined.

74053-3 **RELATED FACILITIES.** Consideration should be given to collocating the Swimming Pool with related recreational facilities in order to (i) take advantage of potential savings in space requirements and operating costs, and (ii) provide users with the increased convenience of clustered facilities. These related recreational facilities include:

- 740 44 Indoor Physical Fitness Center (Gym)
- Other MWR recreational and foodservice facilities such as Clubs and Recreation Centers (for purely recreational pools).

74053-4 **DEMAND.** Swimming Pool facilities are sized on the basis of the peak hour demand at each installation, as follows:

74053-4.1 Use projected base loading data to determine the population for each significant population category, as listed in Table 74053-1.

- 74053-4.2 Calculate peak hour demand by multiplying the population for each category by participation factors found in Tables 74053-1. Add the demand for all population categories to derive Total Demand for each functional component. Adjust the calculated Total Demand as indicated in Table 74053-1 for installations with alternative on-base recreational swimming facilities such as lakes or beaches.
- 74053-4.3 The determination of the length of the pool is a local Command decision which should be based primarily on patron demand and programmatic considerations. A 25-meter length pool is sufficient to satisfy most fitness and recreational swimming needs. The advantage of a 50-meter length is that the pool may be divided up into 2 or 3 areas and utilized simultaneously for different programs. For example, given sufficient demand, a 50-meter length pool divided into three separate areas may be used simultaneously for recreational swimming, lap swimming for fitness training, and an instructional class in life-saving techniques.
- 74053-4.4 Calculate the number of lanes required by dividing the Total Demand by the maximum capacity per hour per lane, indicated in Tables 74053-2 or 74053-3, depending on whether the local Command opts for a 25 meter length or 50 meter length Swimming Pool. In general, the development of Swimming Pools with fewer than 6 lanes and more than 10 lanes is not recommended.

**Table 74053-1. Swimming Facility Demand Calculation**

Note	Population Category	Population (per Base Loading)	x	Participation Factor	=	Peak Hour Demand		
(1), (2)	Enlisted	_____	x	.0043	=	_____	users	
(1), (2)	Officers	_____	x	.0045	=	+ _____	users	
(1), (2)	Retirees	_____	x	.0025	=	+ _____	users	
(1), (2)	Authorized Civilians	_____	x	.0015	=	+ _____	users	
(1), (2), (3)	Dependents	_____	x	.0093	=	+ _____	users	
Total Demand (rounded to the nearest whole unit)						=	_____	users
Adjustment ( <b>subtraction</b> ) for installations with alternative on-base swimming facilities (such as developed beaches or lakes)							- 30	users
Total Demand (rounded to the nearest whole unit)						=	_____	users

Notes for Demand Calculation -- Table 74053-1:

- (1) Population numbers should be consistent with projected base loading data. Officers are O-1 through O-10 and enlisted are E-1 through E-9. Civilians are authorized DoD employees. Retirees are all military retirees within a 30-minute drive of the installation.  
For facility planning purposes at installations with deployable forces, the active duty demand population is comprised of all the non-deployable population, plus two-thirds of the deployable

population, to reflect time away on deployment. However, calculation of the deployable population may be adjusted based on the actual deployment experience at individual installations.

- (2) The participation factors used in the table may be revised periodically by NAVFAC HQ and CNIC (N-9), and the most current figures must be used in all demand calculations.
- (3) Dependent population data may be obtained from the base MWR or Housing Offices.

**Table 74053-2. Swimming Pool Capacity Calculation—25 Meter Length**

Total Demand (rounded to the nearest whole unit)	=	_____ users
Divide by maximum capacity per hour per lane (for a 25 meter length Swimming Pool)		÷ 4 users
Total number of lanes for a 25 meter length Swimming Pool	=	_____ lanes

**Table 74053-3. Swimming Pool Capacity Calculation—50 Meter Length**

Total Demand (rounded to the nearest whole unit)	=	_____ users
Divide by maximum capacity per hour per lane (for a 50 meter length Swimming Pool)		÷ 6 users
Total number of lanes for a 50 meter length Swimming Pool	=	_____ lanes

74053-5 **SPACE ALLOWANCE.** In addition to determining the length of the pool and the number of lanes, a Swimming Pool facility requires a poolside deck area and concession area, as required. Space allowance criteria for these support facilities are presented in Table 74053-4. Furthermore, an adequately sized bathhouse is required and should be sized separately based on the criteria presented under Category Code 74089.

**Table 74053-4. Space Allowances for Swimming Pools**

Note	Table	Functional Component	# Unit s	x	Space Allocation Factor	=	Total NSF	Min. or Max. NSF
<b>ACTIVITY AREAS</b>								
(1), (2)	74053- 2	Swimming Pool—25 meter length	_____	X	674 NSF per lane	=	_____	
(1), (2)	74053- 3	Swimming Pool—50 meter length	_____	X	1,348 NSF per lane	=	_____	
		Poolside Deck Area						
		for Indoor Pool			100% total NSF lanes	=	_____	
		for Outdoor Pool			300% total NSF lanes	=	_____	
<b>BUILDING SUPPORT</b>								
		Entrance/Circulation/Hou sekeeping			10-15% X subtotal NSF Activity Support Areas	=	_____	
		Supplies/Janitor's Closet/ Structure/Partitions						
		Mechanical/Electrical/			5-10% X subtotal NSF Activity Support Areas	=	_____	

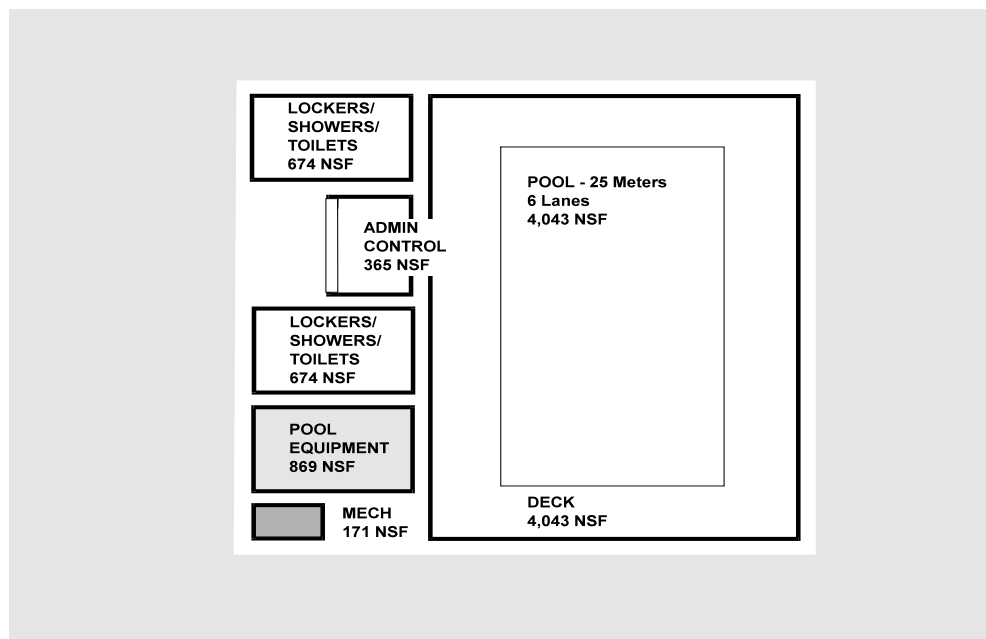
Note	Table	Functional Component	# Units	x	Space Allocation Factor	=	Total NSF	Min. or Max. NSF
		Communication Equipment Space						
		Pool Plant Room (pump, filter, etc.)			20% total NSF lanes	=	_____	
		Chemical Storage Room(s)			60 NSF per room	=	_____	60 min.
		[Separate rooms for different chemicals, as per safety requirements]						
<b>TOTAL FACILITY ALLOWANCE FOR SUPPORT FACILITIES (Gross Square Feet)</b>						=	_____	

Notes for Space Allowance -- Table 74053-4:

- (1) The determination of the length of the pool is a local Command decision which should be based primarily on patron demand and programmatic considerations.
  - (2) Minimum lane width of 7' is recommended, with an additional 1'-6" outside lanes on both sides of the swimming pool.
- NSF = Net Square Feet  
 GSF = Gross Square Feet  
 Minimum or Maximum NSF = Minimum or maximum space allowance to be provided for the particular function or activity.

74053-6 **SAMPLE LAYOUT DIAGRAM.** A layout diagram is presented for a 6-lane, 25-meter length Indoor Swimming Pool facility. This diagram is an example of the composition of such a facility in terms of its functional components, their respective sizes and adjacencies. The layout diagram is for illustrative purposes only.

**Figure 74053-1. Indoor Swimming Pool – 25 Meters**



**740 54 MWR MILITARY RECREATION CENTER (SINGLE SAILOR CENTER / MARINE CENTER) (SF)**

This CCN has been deleted. All existing assets should be reassigned to CCN 74042, Community Recreation Center.

**740 55 YOUTH (6-18 YRS) & SCHOOL AGE CARE (SAC) (6-12 YRS) CENTER (SF)**

**FAC: 7417**

**BFR Required: Y**

SECNAV Approved Standards and Metrics are available for this CCN at <http://mwr.navy.mil/mwrprgms/programstand.htm>

Design Criteria: UFC 4-740-06, webpage: <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-4-740-06>

74055-1 **GENERAL.** See introduction to 740 series category codes for General Instructions regarding facility allowance planning procedures.

74055-2 **DEFINITION.** The Youth Center is a social and recreational center primarily for use by children ages 6 to 18 in support of a Youth Program, as defined by DoD Instruction 6060.3 for School Age Care and DoD Instruction 6060.4 for Youth Programs. The Youth Center supports opportunities for youth to develop their physical, social, emotional, and cognitive abilities and to experience achievement, leadership, enjoyment, friendship, and recognition. Youth Program activities are generally offered free of charge or at a reasonable cost to parents to encourage participation and make them affordable to families. Included in the Youth Center facility, but generally separated from the youth program functions, is a School-Age Care (SAC) program. The SAC program provides accountable child care (ages 6-12) for a fee. This includes picking children up after school or having them dropped off by school bus and keeping them until parents can pick them up from the center.

74055-3 **RELATED FACILITIES.** The location of Youth Centers should be determined primarily for proximity to the family housing areas served - preferably accessible by the youth within fifteen minutes' walk or bicycle ride. Collocation of Youth Centers with other MWR facilities is recommended, in particular with youth playing fields, outdoor playing courts, and playgrounds. Consideration should be given to potential savings in Youth Center space requirements for specific Activity Areas, if other MWR facilities provide the same functions conveniently accessible and available for use by the youth.

74055-4 **SIZE DETERMINANTS.** Several factors determine the size of the facility:



Needs Validation Assessment. Conduct a Needs Validation Assessment to determine the need for each of the three core program areas (SAC Program, Youth Program, and Teen Program), the optional spaces, and the size of the populations to be served by each program. The three core program areas may be sized differently within a single facility. In some cases, one or more core program areas may not be needed if the population served is too small or if that population is served by other, existing facilities. When reviewing existing facilities, consider both facilities on the installation and facilities within the community, such as the Boys & Girls Clubs of America, 4-H, and other community centers.

74055-4.1 **SAC Program Size.** Once the need and population size for the SAC program area has been determined, the SAC area is sized based on the number of SAC activity rooms needed. Each room serves two ratio groups or a total of 30 children. The maximum number of SAC rooms permitted per facility is eight. If the needs assessment determines that more than eight rooms are required, provide multiple facilities.

74055-4.2 **Youth Program Size.** Once the need for the Youth Program area has been determined, the size is classified by the number of youth to be accommodated. Each size category provides for appropriate space in the Commons (including the Game Area, Snack and Eating Areas, and circulation space) and support areas and provides the appropriate number of activity rooms.

**Table 74055-1. Youth Program Size Classifications**

Size Class (No. of Youth)	Navy and Marine Corps Activity Rooms (General or Special)	Navy and Marine Corps Homework / Computer Rooms
Up to 60 Youth	1	1
61 to 90 Youth	2	1
91 to 135 Youth	3	2
136 to 155 Youth	4	2

74055-4.3 **Teen Program Size Classifications:** Once the need for the Teen Program area has been determined, classify the size as follows: Up to 15 teens, 16 to 30 teens, 31 to 45 teens, and 46 to 60 teens.

74055-4.4 **Optional Spaces:** Once the Core program areas have been sized (above), determine which optional spaces should be included. Optional spaces include administrative space, multipurpose room, music or multi media room, laundry room, and outdoor activity area or open area.

74055-5 **SPACE PROGRAM.** The space program for the Youth Centers is developed through the use of an interactive spreadsheet. Please see the website <https://www.wbdg.org/ffc/dod/unified-facilities-space-program-sustainability-spreadsheets> to download the spreadsheet.

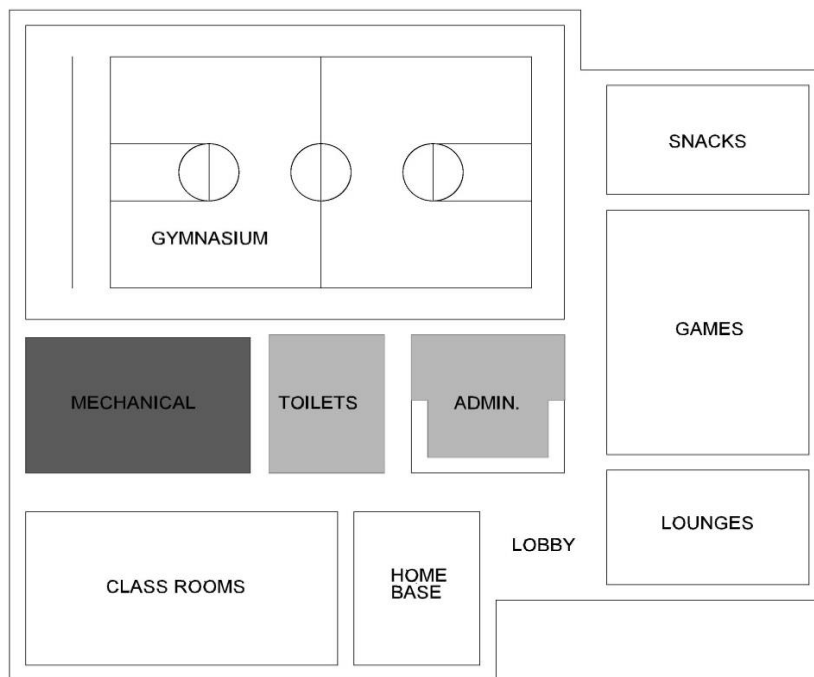
74055-6 **LOCATION DETERMINANTS.** Several factors determine the most appropriate and cost-effective location for a Youth Center.

74055-6.1 **Access.** The Youth Center should be easily accessible by busses (dropping off), privately-owned vehicles (either dropping off/picking up or parking), and by youth patrons via foot or bicycle. Weigh these considerations against the effect on traffic during peak pick-up/drop-off times. For example, a location near or adjacent to a school or child development center may be convenient for patrons, but it may cause traffic congestion at peak times. To accommodate parent/patron access, provide adequate parking as close as possible with a covered walkway to the facility, taking into account AT/FP requirements and parking criteria 852-10.

74055-6.2 **Safety.** Consider the above-noted pedestrian and bicycle traffic by the youth patrons. Minimize the degree to which the pedestrian and bike paths cross vehicular paths in the approach to the Youth Center site. If pedestrian and bike paths cross or run adjacent to busy streets and intersections, provide mitigation measures, such as bollards, to increase safety. Also consider the location of bus access for drop-off and pick-up.

74055-6.3 **Other Factors:** Consider locating near other facilities such as youth sports fields, open park space, etc.

**Figure 74055-1. Youth Center – Medium Capacity**



**740 56 THEATER (SF)**

**FAC: 7431**

**BFR Required: Y**

74056-1 **GENERAL:** See introduction to 740 series category codes for General Instructions regarding facility allowance planning procedures.

74056-2 **DESCRIPTION:** A facility for the presentation of motion pictures selected primarily for the entertainment of active duty Navy and Marine Corps personnel and their dependents, as well as other supported Services located at an Installation.

74056-3 **RELATED FACILITIES:** The mini-theater that may be provided in the Military Recreation Center (Single Sailor Center) should not be counted against this allowance since it is not accessible to families, and is a Category A facility. Theaters are operated as Category C facilities (see General Notes MWR) except for the 8-mm.-film program provided to the ships, Single Sailor Centers, and some Youth Centers. Consequently, to be programmed as a NAF project, any new or replacement theaters would have to be financially justified.

74056-4 **REQUIREMENT:** Space allowances for theaters will be determined by the following method:

74056-4.1 **Step 1:** Determine basic authorized number and seating capacity from Table 74056-1.

**Table 74056-1  
Authorized Numbers and Seating Capacities for Theaters**

<b>Military Population</b> (see note 1)	<b>Authorized Number of Facilities</b>	<b>Seat Capacity</b>	<b>Dressing Rooms</b>
Up to 300	(see note 2)	n/a	n/a
301 to 1,000	1	General Purpose	Without
1,001 to 2,000	1	350	With
2,001 to 3,000	1	500	With
3,001 to 25,000	Program as an auditorium CCN 171-25		

Notes for Table 74056-1:

(1) Military population military strength plus 50% of dependents.

- (2) Accommodate in either CCN 740-42 “MWR Community Recreation Center” or CCN 740-54 “MWR Military Recreation Center”.

74056-4.2 **Step 2:** Determine Environmental Adjustment Factor (EAF) from Table 74056-2 and adjust the seat capacity value obtained from Step 1 accordingly. The maximum allowances obtained from Table 74056-1 must be adjusted to reflect available community support and other recreational facilities available on the Installation. Table 74056-2 gives the environmental variables and the individual EAF's for each variable. The product of these individual EAF's is the final EAF to be used. (An example of EAF use follows Table 74056-2.)

**Table 74056-2. Environmental Adjustment Factors for Theaters**

Condition	Civilian Community Facilities (see note 1)	Other Recreational Facilities (see note 2)	Current Installation Theater (see note 3)
Normal	0.70	0.70	1.00
Poor	1.00	1.00	0.50

Notes for Table 74056-2:

(1) Civilian Community Facilities

Normal: At least one civilian theater or drive-in within 30 minutes driving time of installation and local TV or CATV reception.

Poor: No civilian theater or drive-in within 30 minutes driving time or no local TV or CATV.

Notes for Table 74056-2 (continued):

(2) Other Recreational Facilities (On-installation)

Normal: Three or more of the following five facilities are either available or construction funds have been appropriate:

- 1) a club or open mess
- 2) bowling alley
- 3) hobby shop
- 4) gymnasium;
- 5) playing courts and fields.

Poor: Two or less of the five facilities are available and no construction funds have been appropriated for them.

(3) Current Installation Theater (assuming films are shown nightly and changed weekly)

Normal: At least two shows per week have audiences in excess of 67% of capacity.

Poor: At least two shows per week have audiences less than 50% of capacity.

**EXAMPLE:** Assume the military strength is 6,000. There are several theaters close by and the TV reception is good. The installation has only open messes and a gymnasium that currently doubles as a theater. Current attendance is less than one-third full for two shows.

- 1. **Maximum seating allowance** from Table 74056-1 is: 1,000 seats

2. <b>Environmental Adjustment Factors:</b>	
(a) Civilian community – <b>normal:</b>	select 0.70
(b) Other recreational facilities - <b>poor</b> (since only two of the five types are available)	select 1.00
(c) Current attendance - <b>poor:</b>	select 0.50
Therefore the Environmental Adjustment Factor is (0.70) x (1.00) x (0.5) = 0.35	
3. <b>Adjusted seating capacity is:</b>	1,000 x 0.35 = <b>350 seats</b>
<i>(Use Table 74056-3 for GSF Allowance)</i>	

74056-4.3 **Step 3:** Determine the gross square footage (GSF) requirements for the facility, based on the adjusted seating capacity from steps 1 and 2, and applied to Table 74056-3. All facilities, except the General Purpose facility, will be provided with a stage.

**Table 74056-3. Space Allowances For Theaters**

Adjusted Seat Capacity	Gross Square Feet ( with dressing rooms )	Gross Square Feet ( without dressing rooms )
General Purpose	3,500	3,500
350	6,500	5,800
500	10,900	9,600
1,000	17,200	15,500

**740 60 COMMISSIONED OFFICERS' CLUB (SF)**

**FAC: 7333**

**BFR Required: N**

74060-1 This category code has been deleted. All existing assets should be reassigned to category code 740 67, All Hands Club, and new facilities will be programmed under category code 740 67 and require CNIC N925 and N944 concurrence.

**740 64 ENLISTED CLUB (SF)**

**FAC: 7333**

**BFR Required: N**

74064-1 This category code has been deleted. All existing assets should be reassigned to category code 740 67 All Hands Club, and new facilities will be programmed under category code 740 67 and require CNIC N925 and N944 concurrence.

**740 67 ALL HANDS CLUB (SF)**

**FAC: 7333**

**BFR Required: Y**

Design Criteria: (This category code will become a primary facility in future revisions as: Food / Beverage / Entertainment / Facilities - Clubs) New projects will be reviewed by CNIC N925, N944. Design guidance can be found in FC 4-722-01N Navy and Marine Corps Dining Facilities.

**74067-1 DEFINITION.** This code is used to plan the space requirements for a single facility to accommodate on-base facilities, surrounding competitive environment and size of the supporting population. The facility may include one or more of the following components: Full Table Service Restaurant, Quick Service (over the counter) Restaurant, Banquet/Catering Room(s), Cafeteria, Bingo space, Gaming Room (OCONUS, non-US), Beverage Lounge(s) (may be rank specific) with or without Entertainment. Support spaces such as offices, restrooms, storage, etc. would also be included.

**74067-2 SPACE ALLOWANCE.** For space requirement purposes only, the space allowances in Table 74067-1 may be used. However, the actual size of any programmed club project is based upon market analysis and consequent financial projections that must justify programming of the facility and comply with the financial performance requirements of DODINST 7700.18. Contact CNIC N925, N944 for additional information.

**Table 74067-1. Space Allowances for All Hands Clubs**

Size Classification	Installation Population	Gross Area (SQ.M./SF)
Small	< 3,000	743.22 sq.m/8,000 SF
Medium	3,001 – 7,000	1,300.64 sq.m/14,000 SF
Large	7,001 – 14,000	1,858.06 sq.m/20,000 SF
Extra Large	> 14,000	2,415.48 sq.m/26,000 SF

**740 68 MWR OPERATED CATERING AND CONFERENCE CENTER (SF)**

**FAC: 7333**

**BFR Required: Y**

**74068-1** This facility may be stand alone or combined with and Officers' Club, Enlisted Club, All Hands Club, Bowling Center, Marina Clubhouse, or Golf Clubhouse. The Catering facility often includes bingo operations in at least one room. The size of

the facility is based upon market analysis and consequent financial projections that must justify programming of the facility. New projects will be reviewed by CNI N9.

**740 70 CHIEF PETTY OFFICERS CLUB (SF)**

**FAC: 7333**

**BFR Required: Y**

74070-1 This category code has been deleted. All existing assets should be reassigned to CCN 74067 All Hands Club and new facilities will be programmed under CCN 74067 and require CNIC N925, N944 concurrence.

**740 71 EXCHANGE PACKAGE STORE (SF)**

**FAC: 7346**

**BFR Required: Y**

**74071-1** Navy Exchange facilities requirements are developed by the Navy Exchange Service Command Planning Branch, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724. See General Notes for NEX facilities at the beginning of the 740 Series.

74070-2 This facility provides for retail sales to authorized customers and the transfer (wholesale) of alcoholic beverages to clubs and open messes. A select few locations have package stores operated by MWR as permitted by Congress.

**740 74 CHILD DEVELOPMENT CENTER (SF)**

**FAC: 7371**

**BFR Required: Y**

Child Development Center Space Program spreadsheet, located at:

<https://www.wbdg.org/ffc/dod/unified-facilities-space-program-sustainability-spreadsheets>

Design Criteria: FC 4-740-14N "Navy and Marine Corps Child Development Centers"

<https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/fc-4-740-14n>

**74074-1 DESCRIPTION.** A Child Development Center (CDC) is a facility which provides full and part-day developmental child care services for children from ages of 6 weeks old through 5 years of age.

**74074-2 REQUIREMENT.** Access to developmental child care programs are available to the dependents of active duty military, activated reservists and guardsmen, DoD civilian personnel, and DoD contractors.

74074-2.1 **Demand:** The demand shall be determined by actual count of military dependents through age 5 receiving Installation support who will be using the facility. Actual count must be determined by questionnaire, survey, documented historical data or similar process. Dependents of Civilian Employees through age 5 may be included as per DOD Instruction 6060.2 "Child Development Programs" of March 3, 1989. Justification remains the responsibility of the sponsoring command with requirements based on local needs. Adjust these figures for any projected increase or decrease in military and civilian employee population or mission changes.

74074-2.2 **Demand for New Activities:** Determine the total number of married military families receiving direct Installation support and multiply by 15 percent, plus the number of children of single parent military families receiving direct Installation support. When including dependents of civilian employees, determine the total number of civilian employees and multiply by 2.5 percent.

74074-2.3 **Facility Classification:** The CDC facility sizes are classified as follows, according to the capacity of children it can accommodate:

**Table 74074-1 - CDC Size Classifications**

Size	Capacity
Small	48 to 100 children
Medium	100 to 200 children
Large	201 to 300 children
Extra Large	More than 300 children

74074-2.4 **Capacity:** The minimum capacity for a CDC is 48 children. When a need is identified to accommodate more than 300 children (an extra-large facility size), consideration should be given to expanding the Family Home Care Program to supplement the requirement for center-based care. Contact the CNIC Child and Youth Programs (CYP) Facilities Specialist (N926) to determine Family Care options before developing requirements for additional CDC's.

74074-2.5 **Program Requirement:** Planners developing the requirement for a new facility must combine the facility space allowances provided in the space program spreadsheet (refer to paragraph 74074-2) and the outdoor activity areas referred to in paragraph 74074-2.6.

74074-2.5.1 Entrance canopies may be provided for pickup and discharge of passengers in inclement weather regions.



**74074-2.6 Outdoor Activity Areas:** Provide an area for outdoor activity equipment and play, based on 130 SF per child for 50% of the facility capacity. Larger areas can be programmed if authorized by CNIC N926.

74074-2.6.1 Outdoor shade structure(s) are required for locations where extreme sun conditions occur 80% of the time. In these locations, provide for shade structures over 50% of the total outdoor activity area. If there are trees providing natural shade, then the shade structures could be reduced accordingly. Shade structures (not enclosed) are provided without adding to the building gross square footage calculation, and may be provided either by extending building overhangs over the activity area or by providing stand-alone structures.

74074-2.6.2 Outdoor storage (for playground materials) may be provided as part of the primary facility or as a separate storage shed. This area is included in the results of the space programming spreadsheet.

**74074-2.7 Impact on Neighborhood.** The planner and program manager must give significant consideration to the impact that a large CDC will have on land use, peak traffic patterns and safety of the children. Providing CDC facilities adjacent to or in close proximity to another CDC, youth center, or school facility may have an impact on traffic, but doing so should not be precluded. Adjacent facilities may be more customer responsive in that a parent may have children in both facilities. Additional site criteria can be found in FC 4-740-14N. In addition, OPNAVINST 1700.9E should be reviewed as a source for site and facility guidance.

**74074-2.8 Location:** Significant consideration must be given by the facility planner, in coordination with CNIC and the Installation Commander, to properly locate the CDC in an appropriate and compatible location with regard to the health and safety of the children. Also take into account the practical future expansion of the CDC, adjacent facilities and associated Force Protection issues.

**74074-2.9 Land area requirements.** Table 74042-2 provides planning guidance for the minimum land area that is required to properly site a new CDC facility. This estimated area will accommodate the CDC facility, the outdoor activity area, parking, service areas, and vehicular and pedestrian circulation.

**Table 74074-2 - CDC Site Size Requirements**

CDC Size	Min Site Size- (Acres)	Min Site Size (Hectares)
Small	2.07	0.84
Medium	3.78	1.53
Large	5.15	2.08
Extra Large	6.35	2.57

74074-3 **SPACE PLANNING SPREADSHEET.** Minimum space allowances for Child Development Centers are determined according to the planning criteria incorporated into the Child Development Center Space Program spreadsheet, which can be found at <https://www.wbdg.org/ffc/dod/unified-facilities-space-program-sustainability-spreadsheets>

74074-3.1 Space allowances provide for infant, pre-toddler, toddler, and pre-school age activity rooms/spaces, infant crib space, isolation area with toilet, lobby/reception, food service/kitchen, staff training / lounge / curriculum development spaces, offices, laundry, toilets, janitor closet(s), and storage.

**740 75 NAVY FLYING CLUB FACILITY (SF)**  
**FAC: 7414**  
**BFR Required: Y**

Design Reference: Federal Aviation Regulation (Part 141)

74075-1 The Navy Flying Club is a recreational flying activity located on or near military installations used by authorized personnel and approved by the Department concerned. Flying Clubs are Category C facilities (See General Notes MWR) and must be financially justified for new construction. The space allowances shown in the table below for aero clubs are intended to provide hangar space to be used to maintain aircraft and for aircraft storage during inclement weather to provide ramp space for outdoor aircraft tie-down area, and to provide multipurpose space for administrative, training, classrooms, operations scheduling, safety meetings, and flight planning. Space requirements are based on the number of aircraft operated by the club.

74075-2 Each Navy Flying Club facility must have adequate area for refueling operations, i.e. fuel truck or permanent tanks that meet all local, state, and federal regulations pertaining to that operation.

**Table 74075-1. Space Allowances for Aero Clubs**

Number of Aircraft	Gross SF Hangar Space	Gross SF Multi-Purpose Space	Gross SF + Ramp Space (Approx. 45' x 20')
1	900	500	Note (1)
2 to 5	2,300	1,000	Note (1)
6 to 10	3,800	1,200	Note (1)
11 to 15	5,300	1,500	Note (1)
16 to 20	6,800	1,700	Note (1)
For each additional 5, add	1,500	375	Note (1)

Note (1): For each aircraft operated multiply by 1350 SF to obtain the required Ramp Space.  
(Number of aircraft\_ X 1350 SF = Ramp SF)

**740 76 LIBRARY (SF)****FAC: 7416****BFR Required: Y**

SECNAV Approved Standards and Metrics are available for this CCN at  
<http://mwr.navy.mil/mwrprgms/programstand.htm>

74076-1 **Main Libraries.** This facility is for recreational reading and study. Space allowances are given in Table 74076-1. The allowances may be increased to 10% where the facility is also designated as a command reference center. If bookmobiles are operated from the main library, an additional 300 SF per bookmobile will be required for book storage, trucks, and work space for bookmobile staffs.

74076-2 **Branch Libraries.** Based on individual justification, branch libraries may be provided in support of an educational services office or for each increment of 3,000 military strength over 10,000. Each branch library shall not exceed 4,000 gross SF area. Where practical, the individual incremental allowances may be combined in one branch library.

For BFR purposes: The total allowance is the main library plus the branch libraries.

**Table 74076-1. Space Allowances For Main Libraries**

Military Population (1)	Gross SF
Up to 500	2,500 (2)
501 to 1,500	4,500
1,501 to 2,500	6,250

<b>Military Population (1)</b>	<b>Gross SF</b>
2,501 to 4,000	8,000
4,001 to 6,000	10,500
6,001 to 8,000	12,000
8,001 to 12,000	18,000
12,001 to 16,000	20,000
16,001 to 20,000	24,000
20,001 to 26,000	30,000
26,001 to 32,000	36,000
32,001 to 40,000	44,000
40,001 to 50,000	54,000
50,001 to 60,000	64,000
60,001 to 70,000	72,800
70,001 to 80,000	81,000
80,001 to 90,000	90,000
90,001 to 100,000	98,000
For each additional 10,000, add	8,000

- (1) Military population is active duty military plus 40% of dependents.  
(2) Accommodate in other facilities.

**740 77 MWR READY ISSUE/SHOP STORES/MISC. STORAGE (SF)**

**FAC: 4421**

**BFR Required: Y**

(Not applicable to Marine Corps activities)

74077-1 Storage facilities for miscellaneous equipment and/or goods related to community support will be provided only where they can be individually justified. There are no criteria for this type of facility. General information on normal stacking heights, SF per measurement ton requirements and other parameters are provided in Category Code 440 series.

**740 78 RECREATION PAVILION (SF)**

**FAC: 7531**

**BFR Required: Y**

74078-1 The purpose of this facility is to support recreation areas such as parks, playgrounds, picnic areas, beaches, etc. This facility may include lounge, toilets, bathhouses, storage areas, snack bars, and/or concession stand for limited and related items as required. This CCN also includes concessions stands, restrooms, and

announcer's booth facilities associated with ball fields. Space allowances may be utilized in varying numbers and sizes of pavilions. See Table 74078-1 for space allowances.

**Table 74078-1**  
**Space Allowances For Recreation Pavilions**

<b>Military Population (1)</b>	<b>Gross SF</b>
Up to 1,000	800
1,001 to 3,000	1,350
3,001 to 7,000	2,600
7,001 to 10,000	3,200
10,001 to 15,000	4,000
15,001 to 20,000	4,900
20,001 to 25,000	5,600
25,001 to 30,000	6,300
30,001 to 40,000	7,300
40,001 to 50,000	8,500
50,001 to 60,000	9,600
60,001 to 70,000	10,600
70,001 to 80,000	11,500
80,001 to 90,000	12,400
90,001 to 100,000	13,300
For each additional 10,000 add	900

- (1) Military population consists of active duty military plus 60% of dependent population and 25% of retirees supported by the installation.

**740 79 RIDING STABLES (SF)**

**FAC: 7444**

**BFR Required: Y**

74079-1 Provides space for single stalls, box or double stalls, treatment stalls, quarantine areas, quarters for one operator, hay storage area, grain room, tack lockers, sweat pad and blanket drying area, office, and toilets. See Table 74079-1 for space allowances. This CCN also includes boarding stable operations. Both stable types are Category C facilities (See General Notes MWR) and require financial justification for new construction.

**Table 74079-1  
Space Allowances for Riding Stables**

<b>Military Population (1)</b>	<b>Gross SF</b>
Up to 100	None
101 to 1,000	2,100
1,001 to 3,000	2,500
3,001 to 5,000	3,600
5,001 to 7,000	4,700
7,001 to 10,000	5,900
10,001 to 15,000	7,700
15,001 to 20,000	9,600
20,001 to 25,000	11,250
25,001 to 30,000	12,800
30,001 to 40,000	17,800
40,001 to 50,000	18,600
50,001 to 60,000	20,400
60,001 to 70,000	22,800
70,001 to 80,000	24,900
80,001 to 90,000	27,000
90,001 to 100,000	29,000
For each additional 10,000 add	1,600

(1) Military population consists of military strength plus 25% of dependent population.

**740 80 GOLF CLUBHOUSE (SF)**

**FAC: 7413**

**BFR Required: Y**

74080-1 **GENERAL.** See General Notes to 740 series category codes for General Instructions regarding facility allowance planning procedures. Contact CNIC (N9) for additional information.

74080-1.1 In siting golf clubhouses, it is important for sight lines from the pro shop to the first and tenth holes to be maintained. It is also desirable for sight lines from the patio or snack bar areas to the ninth and eighteenth greens to be maintained.

74080-1.2 All golf clubhouse projects must be financially justified as Category C operations. See General Notes MWR at the beginning of the 740 Series.

74080-1.3 Catering Facilities (740-68) may be constructed as part of a golf clubhouse to serve both golf functions and other catering business. When this is done, the restroom support areas should be calculated separately for the golf clubhouse and the catering facility.

74080-2 **DEMAND.** The primary functional components of a Golf Clubhouse - Foodservice and Golf Equipment Areas - are sized based on the number of holes of the golf course and other user demand factors, as follows:

74080-2.1 Use Table 74080-1 to determine the seating demand for each foodservice area. Calculate the number of snack bar and lounge or combined snack bar/lounge seats required to serve golfing patrons, based on the number of golf course holes. Additional capacity may be required to serve non-golfing patrons in snack bar, lounge, and function room spaces, as directed in Notes (1) and (2) to Table 74080-1. Add golfing and non-golfing patron demand to determine number of seats required for each functional component. Food service seating areas should be sufficient to seat a full golf scramble at one time. This would indicate a capacity of 72 seats for 9-hole courses and 144 seats for 18-hole or larger courses. This seating could be in a function room, a snack bar/dining area, a covered patio, or a combination of adjacent areas. Demand for both dining space and pro shop is developed not only by population and number of holes, but also by the number of rounds of golf played on an annual basis.

74080-2.2 Multiply the number of seats required for each functional component by the space allocation factors in Table 74080-2.

74080-2.3 Demand for golf equipment facilities - pro shop, golf bag and cart storage - is directly related to the number of golf course holes. Multiply the number of 9-hole units by the space allocation factors in Table 74080-2. Golf Club Storage for privately owned clubs is not generally a primary functional component because the return on investment for the space required is insufficient to break even financially. Storage of rental clubs is a subset of the Pro Shop along with retail merchandise stock storage.

74080-2.4 Add the net square footage (NSF) for all components and add support area factors as directed in Table 74080-2, to derive the Total Facility Allowance for the Golf Clubhouse.

74080-2.5 Demand for golf course support facilities—golf cart storage—is directly related to the number of golf course holes and golf cars. Criteria for maintenance and storage facilities can be found in Category Code 740 82 "Golf Storage and Maintenance Facility" Cart storage facilities are supported for the number of MWR owned or leased carts. The number of MWR golf carts should be approximately 18 per 9 holes. The number may increase for snack/beverage service carts and course marshal carts. Where the cart storage is located away from the golf maintenance facility a separate maintenance area should be

included within the facility. Construction of space for rental to private golf cart owners is not authorized. Multiply the number of units for each functional component by the space allocation factors in Table 74080-3 to determine the space allowances.

**Table 74080-1. Golf Clubhouse Foodservice Seating Capacities**

Note	Number of Golf Course Holes	Snack Bar	Lounge	Combined Snack Bar/Lounge	Function Room
(1), (2)	9-18	20	10	25	--
(1), (2)	27-36	40	20	50	--
(1), (2)	45-54	60	30	75	--

Notes for Foodservice Seating Capacities:

- (1) The figures for seating capacities accommodate only golfing patron demand. Additional snack bar, lounge, and combined snack bar/lounge capacity for non-golfing patrons must be justified by demand analysis and economic operations projections based on local conditions. For example, if the golf course is situated near other installation facilities with significant numbers of workers, there may be a substantial number of non-golfing patrons at lunchtime. In the absence of specific local installation data, assume that non-golfing patron demand requires a 100% increase in snack bar seating and 50% increase in lounge seating from that required to meet the demand of golfing patrons alone.
- (2) The capacity of a function room should be based on the size of special events and large group functions for which there is a local requirement, justified by demand analysis and economic operations projections.

74080-3 **SPACE ALLOWANCES.** Space allowances for Golf Clubhouse facilities are determined according to the planning criteria presented in Tables 74080-2 and 74080-3, below. The total allowance for a facility is the sum total of the space allowances for each functional component. Seating capacity requirements for foodservice components are obtained from Table 74080-1.

**Table 74080-2. Space Allowances For Golf Clubhouses**

Note	Table	Functional Component	# Units	x	Space Allocation Factor	=	Total NSF	Minimum NSF
<b>ACTIVITY AREAS</b>								
		<b>Foodservice</b>						
	A	Snack Bar (including seating, kitchen, storage)	___	x	27 NSF per seat	=	___	
	A	Lounge (including seating, bar, storage)	___	x	20 NSF per seat	=	+ ___	
(1)	A	Combined Snack Bar/Lounge (including seating, kitchen, bar, storage)	___	x	25 NSF per seat	=	+ ___	
	A	Function Room (including seating, service kitchen)	___	x	17 NSF per seat	=	+ ___	



Note	Table	Functional Component	# Units	x	Space Allocation Factor	=	Total NSF	Minimum NSF
		Pro Shop (including sales area, stockroom)	___	x	500 NSF per 9 holes	=	+ ___	530
(2)		Golf Cart Storage/Rental	___	x	150 NSF per 9 holes	=	+ ___	200
Subtotal Activity Areas						=	___	
<b>ACTIVITY SUPPORT AREAS</b>								
		Patron Support (including lockers, showers, toilets)	20% x Subtotal Activity Areas			=	___	
		Administration/Storage/Support	5% x Subtotal Activity Areas			=	+ ___	120
Subtotal Activity Support Areas						=	___	
<b>BUILDING SUPPORT AREAS</b>								
		Lobby/Circulation/Structure/Partitions	25% x (Subtotal Activity Areas + Subtotal Activity Support Areas)			=	+ ___	
		Mechanical/Electrical/Communication Equip. Space	5-10% x (Subtotal Activity Areas + Subtotal Activity Support Areas)			=	+ ___	
(3)	<b>TOTAL FACILITY ALLOWANCE</b>					=	___	GSF

**Table 74080-3. Space Allowances for Golf Course Support Facilities**

Note	Table	Functional Component	# Units	x	Space Allocation Factor	=	Total NSF	Minimum NSF
(4)		Golf Car Storage	___	x	65 NSF per car	=	___	

Notes for Space Allowance Tables 74080-2 and 74080-3:

- (1) A combined snack bar/lounge may be provided as an alternative to separate snack bar and lounge areas.
- (2) Minimum 200 NSF for golf bag and cart storage allows for 60 club sets (both patron-owned and rental), with bags and carts.
- (3) Covered outdoor space (such as an entrance canopy or sheltered patio) is counted at 50% of its area, and must be included within the total gross square footage allowance for the facility.
- (4) For safety reasons, the golf car storage facility should be a separate structure, or designed for safety separation if accommodated in the same structure.

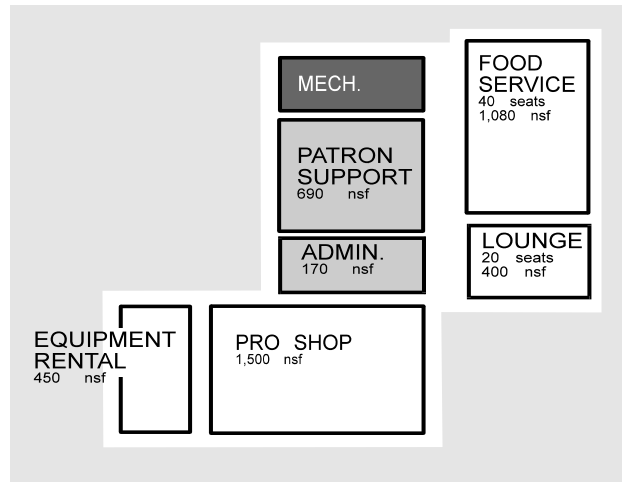
NSF = Net Square Feet

GSF = Gross Square Feet

Minimum NSF = Minimum space allowance to be provided for the particular function or activity.

**74080-4 SAMPLE LAYOUT DIAGRAM.** A layout diagram is presented for a medium-size Golf Clubhouse facility. This diagram is an example of the composition of such a facility in terms of its functional components, their respective sizes and adjacencies. The layout diagram is for illustrative purposes only.

Figure 74080-1 Golf Clubhouse – Medium Capacity

**740 81 MWR RENTAL ACCOMMODATIONS (SF)****FAC: 7442****BFR Required: Y**

74081-1 **GENERAL.** See General Notes to 740 series category codes for General Instructions regarding facility allowance planning procedures. Contact CNIC (N944) for additional information.

74081-2 **DEFINITION.** MWR Rental Accommodations are permanent “stand-alone” or multiplex structures. They may take the form of modern motels, multi-level hotels, primitive camping cabins with no utility connections, or almost anything in between, depending on the geography, the market being served, and demand. Such MWR Rental Accommodation facilities are typically developed to provide recreation overnight and extended stay units in locations which offer outdoor leisure opportunities such as boating, canoeing, fishing, hiking, skiing, golfing, swimming/beach-going, and leisure travel/tourism.

In addition to sleeping rooms/areas, each Rental Accommodation may include a living/dining space, bathroom, kitchen (or kitchenette), and storage area. An open or covered outdoor seating terrace/deck/patio may be provided in appropriate locations.

Where clusters of cottages are planned, a support facility may be included to provide for a janitor closet, laundry, linen storage, and housekeeping supplies/equipment storage.

74081-3 **RELATED FACILITIES.** Locations suitable for the development of MWR Rental Accommodation facilities may also include RV Parks, camping sites, marinas, golf courses, beachfronts, other waterfronts, other outdoor recreation venues, or support facilities to provide patrons with a range of options for accommodation. Support

facilities may include recreation/amusement centers, snack bars/restaurants, administrative/check-in offices, supply stores, swimming pools, cabanas, or bathhouses.

74081-4     **SPACE ALLOWANCE.** Space allowances for rental accommodations need to address the following issues:

74081-4.1     **Total Number of Accommodation Units**

The total number of rental accommodation units planned for a site should be based on the following considerations:

- Capacity of the site to accommodate the development of units in a manner which is economical, environmentally appropriate, aesthetically pleasing, and appropriate for the market to be served. Critical site planning considerations include vehicular access and parking, utilities, Antiterrorism/Force Protection (ATFP) considerations, privacy, views, and preservation of flora and fauna. For example, the development of a sufficient number of units in a location with steep, densely wooded slopes would need to weigh the costs of infrastructure provision and the clearing of areas with the impact on the environment.
- Return on Investment (ROI) analysis is based on projected demand/market, revenues, capital investment, and operating and maintenance costs. This type of analysis will determine the financial feasibility of the proposed project and the number and type of units required to ensure a viable outcome. This analysis must follow the requirements of the template developed by Navy Personnel Command (PERS-652). This template may be obtained by e-mailing your request to either P652D2@persnet.navy.mil or P656D@persnet.navy.mil.

74081-4.2     **Types and Sizes of Individual Rental Cottages/Units**

The type/size of individual units is based on the customer/patron demand determined through a market research/survey process. The research should determine whether individual cottages, efficiencies, primitive camping cabins, or motel/hotel-type lodging is required to meet the documented demand. The space allowance guidance for the different sizes of cottages, efficiencies, cabins, and motel spaces is presented in Table 74081-1 below. The space shown should normally be considered the maximum, with larger units requiring additional justification. Individual units may also include porches, patios, balconies, or deck, etc. that may be covered, open, or screened that are not counted against the respective space allowance guidance.

**Table 74081-1 Space Allowances for MWR Rental Accommodations**

CAPACITY	SPACE ALLOWANCE GUIDANCE (Gross Area)	
	2 Bedroom Cottage	800
3 Bedroom Cottage	1,000	92.90
Efficiency	500	46.45
Primitive cabin	150	13.94
Single Room	240	22.30
Double Room	350	32.52
Queen Room	400	37.16
King Room	440	40.88
Queen Suite	500	46.45
King Suite	550	51.10
Group Camp (per 8 bunks) (Accommodates 16 people)	1600	148.64

74081-5 **SPACE PROGRAMS.** Space programs for two-bedroom MWR Rental Accommodation (Cottages) are presented to illustrate the possible breakdown of the overall space allowances into functional components, with their respective sizes and capacities. This space program is for illustrative purposes only.

74081-6 **SAMPLE LAYOUT DIAGRAM.** A layout diagram is presented for a two-bedroom MWR Rental Accommodation (Cottage), illustrating the relative sizes and adjacencies of component areas.

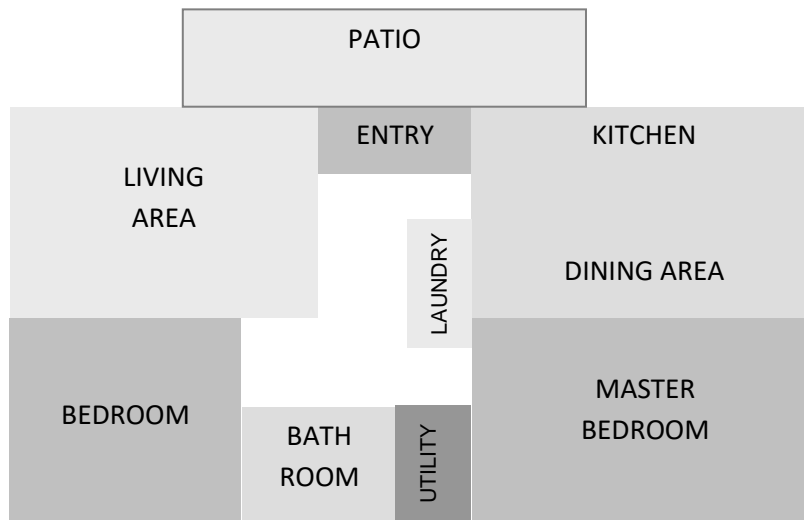
74081-7 **SITE PLANNING.** When site planning for a group of MWR Rental Cottages, keep in mind that privacy between cottages is important and that subdivision or zero-lot-line development is discouraged as it detracts from the quality of the experience for the intended patrons.

**Table 74081-2 MWR Rental Accommodation Sample Space Program**

ROOM / SPACE	FLOOR AREA (SF)			No. of Occupants Design
	No. Req'd	Net Area Per Room	Total Net Area	
<b>2-Bedroom Unit</b>				
Entry Foyer	1	20	20	3
Living Area	1	200	200	6
Kitchen/Eating Area	1	140	140	4
Master Bedroom	1	155	155	2

ROOM / SPACE	FLOOR AREA (SF)			No. of Occupants Design
	No. Req'd	Net Area Per Room	Total Net Area	
Bedroom 2	1	125	125	2
Bathroom	1	70	70	-
Laundry Closet	1	30	30	-
Utility Room	1	As required		-
<b>Net Area &amp; Occupant Totals</b>			740	6
Allowance for porch, deck, or lanai	23,600		150	6

**Figure 74081-1. MWR Rental Accommodation Sample Layout**



74080-1 **GENERAL.** See General Notes to 740 series category codes for General Instructions regarding facility allowance planning procedures. Contact CNIC (N9) for additional information.

74080-1.1 In siting golf clubhouses, it is important for sight lines from the pro shop to the first and tenth holes to be maintained. It is also desirable for sight lines from the patio or snack bar areas to the ninth and eighteenth greens to be maintained.

74080-1.2 All golf clubhouse projects must be financially justified as Category C operations. See General Notes MWR at the beginning of the 740 Series.

74080-1.3 Catering Facilities (740-68) may be constructed as part of a golf clubhouse to serve both golf functions and other catering business. When this is done, the restroom support areas should be calculated separately for the golf clubhouse and the catering facility.

**740 85 EXCHANGE DISTRIBUTION CENTER (WAREHOUSE) (SF)****FAC: 7388****BFR Required: Y**

74085-1 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724, Head, Planning Branch. See General Notes for NEX facilities at the beginning of the 740 Series.

74085-2 This type warehouse may be provided for bulk back-up storage (exchange stock and operating supplies) to support all exchange operations within a geographical area as determined by NEXCOM or Marine Corps Exchange Services.

74085-3 This central warehouse allowance does not void the need for the installation exchange warehouse, Code 740-86, preferably located contiguous to the exchange main retail store. Space allowances for central warehouses shall be provided by NEXCOM.

**740 86 EXCHANGE INSTALLATION WAREHOUSE (SF)****FAC: 7388****BFR Required: Y**

74086-1 Navy Exchange facilities requirements are developed by the Navy Exchange Service Command, 3280 Virginia Beach Blvd, Virginia Beach, VA 23452-5724; Head, Planning Branch. See General Notes for NEX facilities at the beginning of the 740 Series.

74086-2 The total storage space that may be provided in installation exchange warehouses to accommodate back-up storage for exchange retail activities on an installation will be provided by NEXCOM. Wherever practicable, the installation exchange warehouses shall be located contiguous to the exchange main retail store in order to reduce the cost of moving stock from the warehouse to the main store sales area.

**740 87 MARINA SUPPORT BUILDING (SF), Revised Dec 2011****FAC: 7445****BFR Required: Y**

74087-1 This facility provides space for office, equipment check-out, repair, and storage. It does not include docks, marina slips, and walkways which are listed under Code 750 60. This is a special facility which is required only at outdoor recreation areas which have waterfront facilities available for boating activities.

74087-2 This facility may be made up of more than one individual building. Generally, repair facilities would be located in a separate building spaced away from the marina dock, clubhouse and patron parking. The marina clubhouse may include space for dock master/marina manager’s office, meeting/training, yacht club office, chandlery/store with convenience items, customer service counter, shower room/restrooms, and equipment storage/checkout. The marina may also support a stackable boat storage facility and a dry land storage operation in either a fenced compound or in small, individual boat storage facilities attached to each other in a T-hangar fashion. All marina facilities must be justified financially. See Category C facilities, General Notes MWR, beginning of 740 Series Section.

See Table 74087-1 for space allowances.

**Table 74087-1  
Space Allowances for Marina Support Building**

<b>Military Population (1)</b>	<b>Gross SF</b>
Up to 100	None
101 to 1,000	3,500
1,001 to 3,000	5,800
3,001 to 5,000	8,450
5,001 to 7,000	10,500
7,001 to 10,000	12,650
10,001 to 15,000	15,600
15,001 to 20,000	18,700
20,001 to 25,000	20,800
25,001 to 30,000	22,000
30,001 to 40,000	23,600
40,001 to 50,000	25,400
50,001 to 60,000	27,000
60,001 to 70,000	28,300
70,001 to 80,000	29,500
80,001 to 90,000	30,600
90,001 to 100,000	31,600
For each additional 10,000 add	1,000

(1) Population consists of retirees and military strength plus 15% of dependent population.

**740 88 EDUCATIONAL SERVICES OFFICE (SF)**

**FAC: 7351**

**BFR Required: Y**

74088-1 The space allowances shown in Table 74088-1 are intended to provide facilities for the advancement of the academic, technical, and vocational education of military personnel of all grades and ranks in order to enhance their potential to the service. These facilities shall make joint use of existing classrooms or other suitable facilities to the maximum extent possible. In cases where joint use is impractical and separate educational facilities are requested, detailed supporting justification is required. When justified by installation requirements, a supporting branch library may be provided in accordance with criteria for Code 740 76.

**Table 74088-1. Space Allowances for Educational Services Offices**

<b>Military Strength</b>	<b>Basic</b>	<b>OJT (1)</b>	<b>CAC (2)</b>
Up to 250	(3)	None	None
251 to 1,000	4,125	300	500
1,001 to 3,000	8,700	500	500
3,001 to 5,000	13,500	700	500
5,001 to 7,000	16,100	900	500
7,001 to 10,000	19,800	1,200	500
10,001 to 15,000	26,300	1,700	500
15,001 to 20,000	31,800	2,200	500
20,001 to 25,000	36,300	2,700	500
25,001 to 30,000	40,500	3,200	500
30,001 to 40,000	48,000	3,700	500
40,001 to 50,000	55,000	4,200	500
50,001 to 60,000	60,000	4,700	500
For each additional 10,000 add	4,000	500	500

- (1) On-The-Job Training program management personnel space. This added space is authorized only in newly constructed facilities.
- (2) Career Advisory and Counseling section. This added space is authorized only in newly constructed facilities. If more than one counselor is required, add 80 square feet per counselor.
- (2) Accommodate in other facilities.

**740 89 BATHHOUSE (SF)**

**FAC: 7385**

**BFR Required: Y**

74089-1 **GENERAL.** See General Notes to 740 series category codes for General Instructions regarding facility allowance planning procedures.



74089-2 **DEFINITION.** The primary purpose of a bathhouse is to provide a facility for pool and beach users to store their belongings while using the recreational facility, to clean up, and have a place to use the restroom. In addition, the bathhouse contains the offices for the administrative staff and lifeguards.

74089-3 **RELATED FACILITIES.** This category code should be used in conjunction with the following category codes:

- 740 53 Swimming Pool - Indoor
- 750 30 Outdoor Swimming Pool - Installation

74089-4 **SPACE ALLOWANCE.** The space authorized for a bathhouse should be calculated based on the criteria presented in Table 74089-1. This space allowance is valid for bathhouses supporting pools not collocated with Fitness Centers. Where pools are built with Fitness Centers, the lockers, showers and Toilets are intended to be joint use between the Fitness Center and the pool. For that reason, Fitness Center Unified Facilities Criteria (UFC 4-740-02) support family changing rooms where the pool is collocated. The remaining spaces to support a control desk, pool office, lifeguard office and storage are supported for collocated pools.

**Table 74089-1. Space Allowances for Bathhouses**

Note	Table	Functional Component	# Units	x	Space Allocation Factor	=	Total NSF	Min. or Max. NSF
		<b>ACTIVITY SUPPORT</b>						
		Bathhouse						
(1), (2)	74053-4	Lockers, Showers, Toilets			33.33% total NSF lanes	=	_____	
		Control Desk	_____	X	45 NSF per station	=	_____	45 min.
		Administrative Office	_____	X	120 NSF per office	=	_____	120 min.
		Lifeguard Office	_____	X	40 NSF per station	=	_____	80 min.
		Storage (equip., supplies, etc.)	_____	X	20 NSF per lane	=	_____	100 min.
		Subtotal Activity Support Areas				=	_____	
		<b>TOTAL FACILITY ALLOWANCE (Gross Square Feet)</b>				=	_____	

Notes for Space Allowance -- Table 74089-1:

- (1) The total NSF lanes should be determined in Table 74053-4.
- (2) For undeveloped beaches use a six-lane, 25-meter pool equivalent and for developed beaches use an eight-lane, 50-meter pool equivalent.

NSF = Net Square Feet

GSF = Gross Square Feet

Minimum or Maximum NSF = Minimum or maximum space allowance to be provided for the particular function or activity.

**740 90 MWR EQUIPMENT MAINTENANCE SHOP (SF)**

**FAC: 7448**

**BFR Required: Y**

74090-1 An MWR Equipment Maintenance Shop is required at installations where MWR equipment such as NAF vehicles and grounds maintenance equipment (non-golf), must be maintained. Size according to amount of equipment and equipment size with typical workspace, circulation, and net to gross factors, using a space analysis and equipment inventory list.

74090-2 For MWR Equipment Maintenance Shops previously captured under CCN 74052 “Gun/Skeet and/or Trap Building”:

74090-2.1 These facilities support respective ranges and contain an operator's office, storage, sales area, gun maintenance shop, toilets and lounge. The Gun, Skeet and/or Trap Building is an MWR Category C facility (see General Notes MWR) and must be financially self- sustaining.

74090-2.2 Refer to Table 74090-1. The space allowances in the table may be used in one facility or divided between multiple facilities. Refer to Category Code 750 52 for land requirements.

**Table 74090-1  
Space Criteria for Gun, Skeet and/or Trap Building**

<b>Military Strength (1)</b>	<b>Gross Area (GSF)</b>
Up to 100	None
101 to 10,000	3,950
10,001 to 15,000	4,300
15,001 to 20,000	4,550
20,001 to 25,000	4,800
25,001 to 30,000	5,100
30,001 to 40,000	5,300
Over 40,000	5,500

(1) Military population consists of military strength assigned to installations.

**740 91 MWR OPERATED CAR WASH (SF)****FAC: 7348****BFR Required: Y**

This category code has been deleted. All existing assets and future programmed car wash facilities are to be assigned to either category code 740 32 or category code 740 33 depending on the facility type, building or structure.

**740 92 MWR RV PARK SUPPORT FACILITIES (SF), Revised Dec 2011****FAC: 7443****BFR Required: Y**

74092-1 **GENERAL.** See General Notes to 740 series category codes for General Instructions regarding facility allowance planning procedures. Contact CNIC (N944, N92) for additional information.

74092-2 **DEFINITION.** Recreational RV Parks provide the military community with outdoor recreation opportunities at locations with attractive natural resources. To complement the camping experience, and depending on location, Recreational RV Parks may offer activities such as boating, canoeing, fishing, hiking, hunting, skiing and swimming. Facilities should be designed to take advantage of the natural features of the site, from vegetation to good views to unusual topography. At the same time, development should be environmentally appropriate, and not threaten the preservation of the natural heritage and scenic resources.

The planning criteria in this Category Code addresses the campground support facilities such as camp offices; camp stores; bathhouses; laundry facilities; storage buildings; rental centers, etc. RV park main office facilities may include areas for check-in desks, vending areas, game/activity/community rooms with WIFI service, kitchens, convenience stores, and any necessary ancillary spaces. Bathhouse/laundry facilities should be planned in accordance with Table 74092-1.

Recreational RV Parks are encouraged to make use of the Camp Host concept to assist in the management of the RV Park. Space allowances for MWR Rental Accommodations are addressed under Category Code 740 81. RV Parks may also be associated with Golf Operations and MWR Rental Accommodations. Where an RV Park includes a Rental Accommodation operation, a staff laundry may be included as part of the Support Building.

74092-3 **RELATED FACILITIES.** Where such locations are adjacent to the sea or other body of water, support facilities such as marinas, boat ramps and RV/vehicle/boat storage compounds maybe sited in close proximity to Recreational RV Parks.

74092-4 **SPACE ALLOWANCE.** RV Park Support Buildings will be sized in accordance with a market survey approach. As a Category C facility the RV Park with a Support Building must be profitable and a financial analysis or pro forma will be provided as well as the CNIC Internal Needs Validation Study (INVS), and finally the Project Validation Assessment. The Planner will accomplish the initial demand investigation and review along with local MWR personnel. If the project is financially sound it will be forwarded via the region to CNIC Fleet & Family Readiness (N944A) for INVS Scoring and possible Project Validation Assessment.

74092-5 **SANITARY FACILITIES.** Once the total number of campsites at a location has been determined under CCN 750-59 Recreation Campground, the required patron sanitary facilities may be selected from the criteria in Table 74092-1. This includes allowances for bath/shower facilities as well as laundry facilities. Sanitary facilities should be consolidated with other support buildings such as main offices or camp stores whenever possible. Note that all bathhouse facilities associated with RV Parks should always be captured under CCN 740-92 and never under CCN 740-89 Bathhouse.

**Table 74092-1  
Sanitary Facilities Requirements for Recreational Campgrounds**

#Tent/Trailer	#Water Closets (M/F)	#Lavatories (M/F)	#Showers (M/F)	#Urinals
1-15	1/1	1/1	1/1	1
16-30	1/2	2/2	1/1	1
31-45	2/2	3/3	1/1	1
46-60	2/3	3/3	2/2	2
61-80	3/4	4/4	2/2	2
81-100	3/4	4/4	3/3	2

Notes for Table 74092-1:

(1) For recreational areas having more than 100 tent/trailer/camper/RV sites, provide one additional water closet and lavatory per each additional 30 sites, and one additional urinal per each additional 60 sites.

(2) For laundry facilities, provide one washer and two dryers for every increment of 12 sites or portion thereof.

(3) Use the following gross square foot (GSF) guidelines for fixture/appliance unit sizing. Allowances include net areas plus associated support areas such as shower drying areas; laundry works areas; janitor's closets; mechanical/electrical areas; and circulation space. Net-to-gross area calculations are already included in the following:

- (a) When only (1) water closet is required it must be handicapped accessible; use 56 GSF per unit.
- (b) Where multiple water closets are required, use 56 GSF for the first unit and 22 GSF for all subsequent units.

- (c) Lavatories: 22 GSF per unit
- (d) Showers: 21 GSF per unit
- (e) Urinals: 22 GSF per unit
- (f) Washer/dual-dryer module: 43 GSF per module

### **740 93 SMOKING GAZEBO (SF)**

**FAC: 7384**

**BFR Required: N**

74093-1 Smoking Gazebo's are provided as designated smoking areas outside of Navy and Marine Corps facilities. Size is standard. This CCN is for inventory purposes.

### **740 94 TDY OFFICIAL LODGING (SF)**

**FAC: 7441**

**BFR Required: Y**

Note: Category Code (CCN) 740-94 now includes transient Navy personnel originally captured under CCNs 740-94 and 740-96. All facilities originally captured under CCN 740-96 should be corrected in iNFADs.

74094-1 **GENERAL.** Navy Gateway Inns and Suites (NGIS) Visitor's Quarters provide temporary lodging facilities for visiting personnel at an installation. Initial/preliminary requirements can be generated by local planning staff by following the steps in section 74094-3 "Space Planning." Preliminary site selection will also be performed during the initial planning phase. Once the initial scope is determined, planners will forward the findings to CNIC (N944), Fleet & Family Readiness, Millington, TN (Facilities Support) for review and a subsequent independent assessment will be performed to determine the final project scope. This assessment validates the site selection; determines the final number of room types, support areas, and guest services to be provided; and identifies any companion projects necessary to provide a complete and usable facility.

Table 74094-1 provides a list of potential spaces allowed for a Visitor's Quarters facility and Table 74094-2 provides standardized space allowances for the same. Both tables can be found in UFC 4-720-01 "Lodging Facilities", dated 23 February 2011.

74094-2 **DEFINITION.** These facilities are temporary living accommodations that are rented for a service charge for overnight or short term use to authorized personnel such as official military or civilian visitors to the installation, transient personnel, or families awaiting assignment to quarters. There are two types of lodging facilities:

1. Central. Central facilities accommodate the main check-in function, the majority of the guest services and administration, and the guest rooms and suites. There will always be at least one central facility on an installation that includes visitor lodging.
2. Satellite. Satellite facilities accommodate additional guest rooms, suites and limited services and support functions. They may be located

remotely from the central facility to serve additional installation areas or near the central facility as part of a visitor lodging complex.

Note that the type of facility needs to be defined in order to determine the total allowable space for the project. Table 74094-1 provides a listing of all the LF functional program areas, indicates if each area is included in each type of facility, and describes the function of the area.

**Table 74094-1  
Functional Program Areas**

Functional Program Area	Central	Satellite	Description
<b>Guest Services</b>			
Covered entry	X		Covered vehicle drive for loading/drop-off at main entry
Entrance vestibule	X	X	Entry airlock
Central lobby	X		Central facility lounge seating and circulation space between reception and other central guest services
Satellite lobby		X	Satellite seating/waiting and circulation space adjacent to main entry
Reception	X		Reception desk for check-in/out and guest service
Bell cart station	X	X	Area near the entrance vestibule for storage of bell carts.
Luggage storage	X		Secure room adjacent to reception for storage of guest luggage
ATM	X	X	ATM kiosk
Public toilets	X	X	Public toilets
Fitness room	X	X	Small, guest fitness room
Staff conference room	X		Conference room to accommodate 20 people
Business center	X		Guest-use computers and office equipment
Guest laundry	X	X	Self-service guest laundry
Vending	X	X	Self-service guest vending
Ice	X	X	Self-service ice dispenser on each floor
Guest corridors/ circulation	X	X	Access to guest rooms and remote services
Guest room <sup>1</sup>	X	X	Standard room with a combined living/sleeping area and private bath
Family/business suite (Suite) <sup>1</sup>	X	X	Suite with separate living and sleeping areas, a compact kitchen and private bath
<b>Administration Services</b>			
Lodging communications	X		IT/communications room including guest and staff Internet, television, and administrative file server.
Manager's office	X		Private office
Asst. manager	X		Optional for larger programs; must be validated via CNIC/N9
Front desk supervisor	X		Private office

Functional Program Area	Central	Satellite	Description
Accounting office	X		A single office or up to 3-4 workstations depending upon operation size
Clerical	X		Workstations for clerical staff in an open office area
Work space	X		Copier, printers, facsimile machines, work space, common files, and administrative storage
Cash room	X		Secure room where front desk agents reconcile shift cash functions and store cashier banks
<b>Floor Support</b>			
Janitor areas	X	X	Janitor closet on each floor or wing.
Housekeeping areas	X	X	Housekeeping support and supplies on each floor or wing
Utility rooms	X	X	Mechanical, electrical, communications, and sprinkler rooms located for efficient utility distribution
<b>Back-of-House Support</b>			
Training office	X		Office and/or training material storage area
Central Janitor areas	X	X	Central janitor closet with additional supply storage
Housekeeping manager	X	X	Private office
Soiled linen storage	X	X	Separate storage from clean linens, adjacent to receiving or laundry
Clean linen storage	X	X	Separate storage from soiled linens
Receiving	X	X	Service entrance/loading dock
Receiving/supply office	X		Private office
Linen laundry	X		Space with industrial-grade equipment, based on local service contract linen costs and availability
Supply/general storage areas	X	X	Storage and warehousing of facility supplies
Cleaning fluid storage	X	X	Separate storage for cleaning chemicals
Utility rooms	X	X	Central facility mechanical, electrical, communications, and sprinkler rooms ( <b>note: counted in net to gross ratio</b> )
Break area	X	X	Staff break area with kitchenette and lockers
Staff toilets	X	X	Staff facilities
Maintenance workshop	X		Includes limited storage and accommodates repair of small equipment and furnishings
Grounds equipment storage	X		Space with direct exterior access for grounds and exterior building maintenance supplies and equipment
Service circulation	X	X	Separate stairs, corridors and elevators from guest circulation

<sup>1</sup> The final number, mix and variations of room types will be determined by the individual assessment by CNIC/N9. See 74094-1 GENERAL section for more information.

74094-3 **SPACE ALLOWANCE.** Initial project scope for a new or renovated facility will be determined by performing a series of three steps:

1. Obtain occupancy rate information for the facility or facilities in question for the previous two year period.
2. Calculate the necessary quantity of rooms needed to satisfy the TOTAL demand for an 80% occupancy rate (see the below example for details on calculating an 80% occupancy rate). This is the complete total requirement, and not just the difference between what is currently available and the perceived number of rooms thought to be needed. Note that there are two room types available in a Visitor's Quarters facility and they are both single occupancy: standard rooms (300 NSF) and guest suites (450 NSF.) For planning purposes, apply a 95/05 mix of standard rooms to guest suites once the total room quantity requirement is determined. For example, if 500 rooms are needed, plan for 475 standard rooms and 25 guest suites.
3. Apply the new room quantity requirements (from step 2) and the applicable functional area requirements from Table 74094-1, depending on facility type (Central or Satellite) against the space allowances in Table 74094-2 to obtain a comprehensive facility size. For initial planning purposes, allow for all spaces (required and optional, based on facility type) shown in Table 74094-1.

Below is an example showing the method to calculate projected room quantity requirements based on a two year historical data table. It shows a hypothetical two year occupancy rate for an imaginary facility, as well as a hypothetical list of Certificates of Non-Availability (CNA):

Step1: Obtain loading information from the local MWR lodging staff for the facility or facilities in question. Below is an example of the data that is typically provided:

**FY10 Data**

Month	FY10	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Total/ Overall
# days in month		31	30	31	31	28	31	30	31	30	31	31	30	365
# rooms in the inventory		342	342	342	342	342	342	342	342	342	342	342	342	
Total # room nights per month (RNM)		10602	10260	10602	10602	9576	10602	10260	10602	10260	10602	10602	10260	124830
Total # room nights sold (RNS)		9888	10260	9700	9200	8200	8900	10100	10200	10260	10600	9500	9788	116596
% Occupancy is		93%	100%	91%	87%	86%	84%	98%	96%	100%	100%	90%	95%	93%



**FY11 Data**

Month	FY11	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Total/ Overall
# days in month		31	30	31	31	28	31	30	31	30	31	31	30	365
# rooms in the inventory		342	342	342	342	342	342	342	342	342	342	342	342	
Total # room nights per month (RNM)		10602	10260	10602	10602	9576	10602	10260	10602	10260	10602	10602	10260	124830
Month	FY11	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Total/ Overall
Total # room nights sold (RNS)		10211	9899	10500	10602	9576	10200	9866	10154	9200	10098	9956	9233	119495
% Occupancy is		96%	96%	99%	100%	100%	96%	96%	96%	90%	95%	94%	90%	96%

Notes:

- Step 4) The total # of rooms in the inventory is the total room capacity for a building or series of buildings
- Step 5) The total # of room nights per month = number of days in the month (x) the number of rooms in inventory
- Step 6) The total # of room nights sold is the sum of rooms sold each night for the month
- Step 7) % Occupancy Equation = Total # room nights sold / Total # room nights
- Step 8) CNA = Certificate of Non-Availability

Step 2: For this example, assume the total number of CNAs is 62 for FY10 and 34 for FY11. CNAs must be counted as booked rooms even though in reality they were not actually available.

- a) Calculate the Room Nights per Month capacity (RNM) by multiplying the number of rooms in the facility by the number of nights in each month and then determine the total number of RNM for the two year period. In this case the total RNM is 249,660 (FY10 124,830 +FY11 124,830.)
- b) Calculate the total number of Room Nights Sold (RNS) for the two year period. Add the RNS data for each year PLUS the number of CNAs:  
 $RNS = 116,596 + 119,495 + 62 + 34 = 236,187.$
- c) Determine the average occupancy rate for the two year period by dividing the RNS by the RNM. In this example the current occupancy rate is  $236,187/249,660 = .94603$ , or 94.6%
- d) Programming for an occupancy rate of 80% is accomplished by applying the aforementioned results to the equation:

Where “X” is the projected number of rooms required to fulfill an 80% occupancy rate, multiply the quantity of existing rooms and the current occupancy rate, then divide the product by .8 to determine “X”.

For this example, the equation is:  $X = [342 \times .946] / .8 = 404.42$ , or 404 rooms. The intent of the 80% occupancy rate is to allow greater capacity than the projected need to facilitate room turnover, facility maintenance, mission surges, etc. The percentage of standard rooms to guest suites should be 95% and 05% respectively and all rooms/suites are single occupancy. Thus the final requirement is for 384 standard rooms and 20 guest suites. To check for confirmation that the 404 room projection satisfies the 80% average capacity, substitute 404 for the existing facility room count of 342 and re-calculate numbers based on step 2(a) - 2(c) and the FY 10/11 tables. The results will show occupancy rates at 79% and 81% for the next two years, thus fulfilling the 80% average rate requirement.

Step 3: For this example, the plan calls for a central facility and space requirements will be applied for all the functional areas called out in Table 74094-1. These spaces along with the required room quantities will be applied to Table 74094-2 to define overall preliminary requirements for the facility. The example will use a six floor facility with two wings per floor.

**Table 74094-2. Space Allowances for NGIS Visitor’s Quarters**

Functional Program Area		Base Area (See Note 1)		Space Standard (planning factor)	Notes/explanation	Sample (See Notes 2 & 4)		
		ft2	m2			Option/Qty.	ft2	m2
<b>Guest Services</b>	Entrance Vestibule	100	9.3	Per Facility	Standard size	Required	100	9.3
	Central Lobby	4	0.4	Per Central Facility guest room (gst rm)	Includes lobby circulation and seating areas	Required	1616	150.1
	Satellite Lobby	260	24.2	100sf + 1sf per Satellite gst rm	Reduced circulation and seating	N/A		0.0
	Reception	150	13.9	150sf <100 Program gst rm + 75sf per ea addl 100 gst rms up to 375sf max	75sf per staff, minimum two staff. Count all program guest rooms	Required	375	34.8
	Bell Cart Station	20	1.9	20sf <100 Facility gst rm + 10sf per ea addl 50 gst rms	10sf per cart	Required	80	7.4
	Luggage Storage	75	7	75sf <100 Program gst rm + .25sf per ea addl gst rm to 150sf max	Count all program guest rooms	Required	150	13.9
	ATM	10	0.9	Per optional Central Facility space	Optional one ATM machine	Yes	10	0.9

Functional Program Area	Base Area (See Note 1)		Space Standard (planning factor)	Notes/explanation	Sample (See Notes 2 & 4)			
	ft2	m2			Option/Qty.	ft2	m2	
Public Toilets	100	9.3	Minimum for Central Facility toilets is 100 sf ea (male/ female) up to 100 guest rooms + 40sf per ea addl 45 guest rooms. Satellite facilities do not have a public restroom requirement	Based on information in UFCs 3-420-01, and 4-740-03. Applicable codes will dictate final requirement during the independent assessment phase. See General section 74094-1	Required	340	31.6	
Unisex Toilet	50	4.6	Unisex toilet for satellite facility	Satellite facilities only	N/A		0.0	
Fitness Room	300	27.9	300sf <100 Central Facility gstrms +50sf per ea addl 200 gstrm. 600sf max	Calculated at 50sf per cardio machine	Required	350	32.5	
Staff Conference Room	440	40.9	Per optional Central Facility space	Standardized room accommodates 20 people	Yes	440	40.9	
Business Center	75	7	Optional space at 75sf <100 Central Facility gstrms +25sf per ea addl 100 gstrm. 300sf max.	75sf for two workstations and circulation with 25sf for each addl workstation	Yes	175	16.3	
Guest Laundry	110	10.2	Per 40 Facility gstrm	Accommodates two to four washers and two to four dryers per every 40 gstrm	Required	1100	102.2	
Vending	60	5.6	Per optional Facility floor	Accommodates two optional vending machines	Yes	360	33.4	
Ice	30	2.8	Per Facility floor	Accommodates one ice dispenser	Required	180	16.7	
Standard Guest Rooms (See Note 3)	300	27.9	Each room (See Note 3)	Quantity and distribution of rooms and suites to be determined by an independent assessment.	364	115,200	10,702.4	
Suites (See Note 3)	450	41.8	Each suite (See Note 3)	Quantity and distribution of rooms and suites to be determined by an independent assessment.	40	9,000	836.1	
Administrative Services	Lodging Communications	150	13.9	Per Facility	150 sf min; 1 sf per each addl guest room over 100pn	Required	454	42.2
	Administrative areas							
	Manager	120	11.1	Per office	Typically one per Central Facility	1	120	11.1
	Asst. manager	80	7.4	Per optional office	Only in larger programs with more than 500 guest rooms	0	0	0.0

Functional Program Area	Base Area (See Note 1)		Space Standard (planning factor)	Notes/explanation	Sample (See Notes 2 & 4)			
	ft2	m2			Option/Qty.	ft2	m2	
Front desk super	80	7.4	Per office	Typically one per Central Facility	1	80	7.4	
Accounting	64	5.9	Per Person	1 for every 200 guest rooms, not to exceed 256 sf total	2	128	11.9	
Clerical	64	5.9	Per program	One person; typically combined with reservations and work space	1	64	5.9	
Work space	40	3.7	Per person in admin area: Mg., Asst Mgr; and Front Desk Super	Typically combined with clerical and reservations	2	80	7.4	
Cash Room	80	7.4	Per Program	For front desk staff to reconcile shift cash	Required	80	7.4	
Floor Support	Janitor Areas	25	2.3	Per Facility floor wing		Required	300	27.9
	Housekeeping Areas	200	18.6	Per 30 Facility gst rm	Accommodates two carts and storage	Required	2,600	241.5
	Utility Rooms	16	1.5	Per 25 guest rooms	Comm rooms only; other utility rooms programmed by code and included in the multiplier	Required	256	23.8
	Training Office	80	7.4	Per optional private office/storage closet	Typically one per Central Facility	Yes	80	7.4
	Central Janitor Areas	80	7.4	Per Facility	Serves first floor public and administrative spaces	Required	80	7.4
	Housekeeping Manager	80	7.4	Per Program	Typically one per Facility	1	80	7.4
	Soiled Linen Storage	145	13.5	100sf +15sf per 40 Facility gst rm	Includes carts and sorting space; one cart per 40 gst rm	Required	250	23.2
	Clean Linen Storage	150	13.9	25sf per 16 Facility gst rm	Shelving	Required	400	37.2
	Receiving	150	13.9	150sf <150 Program gst rm + 1sf per ea addl gst rm	Loading dock	Required	404	37.5
	Receiving/supply Office	80	7.4	Per program	Office	Required	80	7.4
	Linen Laundry	450	41.8	Optional central facility space at 450sf <100 Program gst rm + 1sf per ea addl gst rm	Includes space for extractors, dryers and folding activities	Yes	754	70.0
	Addl space for folding machine	60	5.6	Per optional folding machine	Additional laundry room space for optional folding machine	Yes	60	5.6
	Supply Areas/general Storage	600	55.7	600sf <300 Program gst rm + 1sf ea addl gst rm	Includes separate cleaning fluid storage	Required	704	65.4

Functional Program Area	Base Area (See Note 1)		Space Standard (planning factor)	Notes/explanation	Sample (See Notes 2 & 4)			
	ft2	m2			Option/Qty.	ft2	m2	
Central Staff Break (includes staff lockers)	150	13.9	150sf <100 Central Facility gst rm + 1sf per ea addl gst rm	Base area typically includes 4-top tables, other seating, kitchenette, and staff lockers	Required	454	42.2	
Addl space if training function	300	27.9	Per optional training module	Additional break room space if this area is to dual function as a training room	Yes	300	27.9	
Staff Toilets	100	9.3	100sf <150 Facility gst rm + 100sf ea addl 150 gst rm	Each 100 sf module includes 50sf for each gender	Required	200	18.6	
Maintenance Workshop	150	13.9	150sf <100 Program gst rm + .5sf per ea addl gst rm	Work and tool storage space	Required	302	28.1	
Grounds Equipment Storage	40	3.7	Per optional Program space	Small shed or exterior closet	Yes	40	3.7	
<b>Notes:</b> 1. Base area assumes 100 guest room facility. 2. Sample is for a 404 room, 6 floor Central Facility in a 404 room program, 5% suites. 3. Ratio of Standard Rooms/Suites is 95/05 for planning purposes. 4. The "Option/Quan" column shows whether or not a space is allowed based on the facility type (Central or Satellite) shown in Table 74094-1 "Functional Program Areas." In this example, all of the spaces shown for a "Central" facility are allowed in the "Space Allowance Table" but this may not always be the case when planning for a "Satellite" facility. For this, some spaces will not be planned.					<b>Sample Subtotal</b>	<b>137,906</b>	<b>12811.6</b>	
					<b>Net-to-Gross Factor @ 30%</b>		41,372	3,843.5
					<b>Sample Total</b>	<b>179,278</b>	<b>16,655.1</b>	

Based on the above example for a 404 room Central lodging facility, the requirement is 179,278 gsf/16,655.1 sm. This provides for an average occupancy rate of 80% based on the room requirements information obtained from section 74094-3 "Space Planning", steps 1 & 2.

**Parking.** Parking must follow the criteria set forth in category code 852-10. Parking spaces shall be 10 ft. wide (3.1m) minimum. In addition to standard guest parking, provide a minimum of three short-term check-in parking spaces at central facilities. For programs with more than 200 rooms, provide a check-in space at the central facility for 1.5% of all guest rooms. As an option, identify each check-in space with a sign. Additional visitor parking with the exception of accessible parking is not required, but may be an option based on local requirements. Provide one staff parking space for

each daytime lodging staff person. Staff parking shall be separated from guest parking. Based on site size and layout, consider providing an optional sign to indicate staff-only parking with close access to the staff entrance. Parking areas will be sized to local conditions.

**740 95 LIMITED SERVICE OFFICIAL LODGING - MISSION (SF),  
FAC: 7441  
BFR Required: N**

74095-1 **GENERAL.** This category code is reserved to capture all existing transient lodging facilities that serve the same function as CCN 740-94 but have been renovated based on previous and outdated criteria. Because of this, the rooms/suites within these facilities vary in size and standardization is not possible. This category code is for inventory purposes only and is not authorized for new construction. All subsequent new construction or renovation projects used to fulfill transient housing requirements shall use CCN 740-94.

**740 97 FISHER HOUSE (SF)  
FAC: 7441  
BFR Required: N**

74097-1 **GENERAL.** This category code is for inventory purposes only and should be used to capture Fisher House facility assets once they are turned over to the federal government by the Fisher House Foundation.

DON Fisher Houses provide temporary, convenient, and affordable lodging to Navy Medical Treatment Facility (MTF) patients (“wounded warriors”), members of the families of such patients, and others providing the equivalent of familial support for such patients. Fisher Houses are located at or near military medical treatment facilities and are gifted to the Navy once the facilities are constructed and furnished. The Fisher House Foundation typically coordinates any repairs during the initial 12 month warranty period but all subsequent repairs are the Navy’s responsibility. The Fisher House Foundation holds no interest in the property following transfer to the Navy; however, Fisher Houses will always bear the “Fisher House” name and may never be recapitalized for use as a different type of facility.

For dedicated housing (unaccompanied) for wounded service members please refer to CCN 72147 “Unaccompanied Housing for Wounded Warriors”.

74097-2 **DEFINITION.** Fisher Houses are housing facilities that fit the following conditions:

- A. Are located in proximity to a military health care facility;

- B. Are available for temporary residential use by patients of that health care facility, family members of such patients, individuals providing the equivalent of family support for such patients and/or individuals who meet Service eligibility requirements; and
- C. Are constructed and donated by the Fisher House Foundation or designated by the Secretary of the Navy.

74097-3      **SPACE ALLOWANCE.** Fisher House space allowances are based on a variety of factors and are determined by a collaborative validation of need between the Fisher House Foundation, the receiving medical center, and Commander, Navy Installations Command. (CNIC). There is no standard size requirement but Fisher Houses typically range in size between 5,000 and 16,000 SF, provide 8 to 21 suites, and accommodate 16 to 42 family members. Fisher Houses typically feature a common kitchen, laundry facilities, large dining room, and spacious living room with library.

**740 98      NGIS-OPERATED CONFERENCE CENTER (SF)**  
**FAC: 6100**  
**BFR Required: N**

74098-1      **GENERAL.** This criteria is currently being written and will be posted upon completion.

**741 40      PRIVATE/ORGANIZATION CLUB BUILDING (Marine Corps only) (SF)**  
**FAC: 7414**  
**BFR Required: Y**

74140-1      **GENERAL.** A facility for use by active duty military personnel, authorized civilians, and their family members for private organization/club meetings and activities that are not affiliated with the US government.

**744 80      GOLF STORAGE MAINTENANCE FACILITY (SF)**  
**FAC: 7448**  
**BFR Required: Y**

74480-1      **GENERAL.** Any proposed new construction must first go through the pre-Internal Needs Validation Study (pre INVS), full Internal Needs Validation Study (INVS), and Project Validation Assessment (PVA). This is a special facility which is required only at installations which have a minimum nine-hole golf course. See also: 740 90 "MWR Maintenance Shop" for non-golf related MWR maintenance facilities.

74480-2 SPACE ALLOWANCE. The Golf Storage/Maintenance Facility consists of space for two separate functions: storage area and maintenance area.

**Storage Area (see Figure 74082-1):** This area consists of spaces for maintenance equipment (e.g. mowers, aerators, etc.), fertilizer, pesticide and herbicide storage and secure chain link storage cage for small equipment (e.g. weed eaters, hand tools, etc.). This area has a standard size of 4,500 SF.

**Maintenance Area (see Figure 74082-2):** This consists of space for: administrative offices, men’s & women’s staff locker rooms with showers, restrooms, break room, maintenance area, an equipment lift, mechanics work area, an enclosed blade grinding room, air compressor and used oil recovery. This area will require 4,000 SF.

**Table 74480-1  
Storage Area**

Note	Table	Functional Component	# Units	X	Space Allocation Factor	=	Total NSF	Minimum NSF
		Storage Area	1	X	4,500 sf	=	4,500	4,500
		Maintenance Area	1	X	4,000 sf	=	4,000	4,000

**Table 74480-2  
Maintenance Area**

ROOM/SPACE:		NET FLOOR AREA			OCCUPANCIES		
		No. Req'd	Net Area/Rm	Total Net Area	Staff		Total
1	Superintendent Office	1	120	120			
2	Mechanical Repair Area (which includes a 170 SF grinding room and 140 SF for Equipment Parts Storage)	1	2,570	2,570			
3	Mechanic’s Office	1	120	120			
4	Female Locker Room	1	200	200			
5	Break Room	1	270	270			
6	Open Staff Work Area	1	120	120			
7	Male Locker Room	1	250	250			
8	Janitor’s Closet	1	50	50			
9	Elec/Comm/Tele Room	1	150	150			



ROOM/SPACE:		NET FLOOR AREA			OCCUPANCIES		
		No. Req'd	Net Area/Rm	Total Net Area	Staff		Total
1 0	Mechanical Room	1	150	150			
	Totals		4,000	4,000			

Generally, Golf Support/Maintenance Facilities would be located on the periphery of the golf course but away from the clubhouse and patron parking. Note that golf cart storage is not included here and is supported under CCN 740-80 GOLF CLUBHOUSE.

See next page for concept diagrams for maintenance and storage areas.

Figure 74480-1  
Maintenance Area Concept Diagram

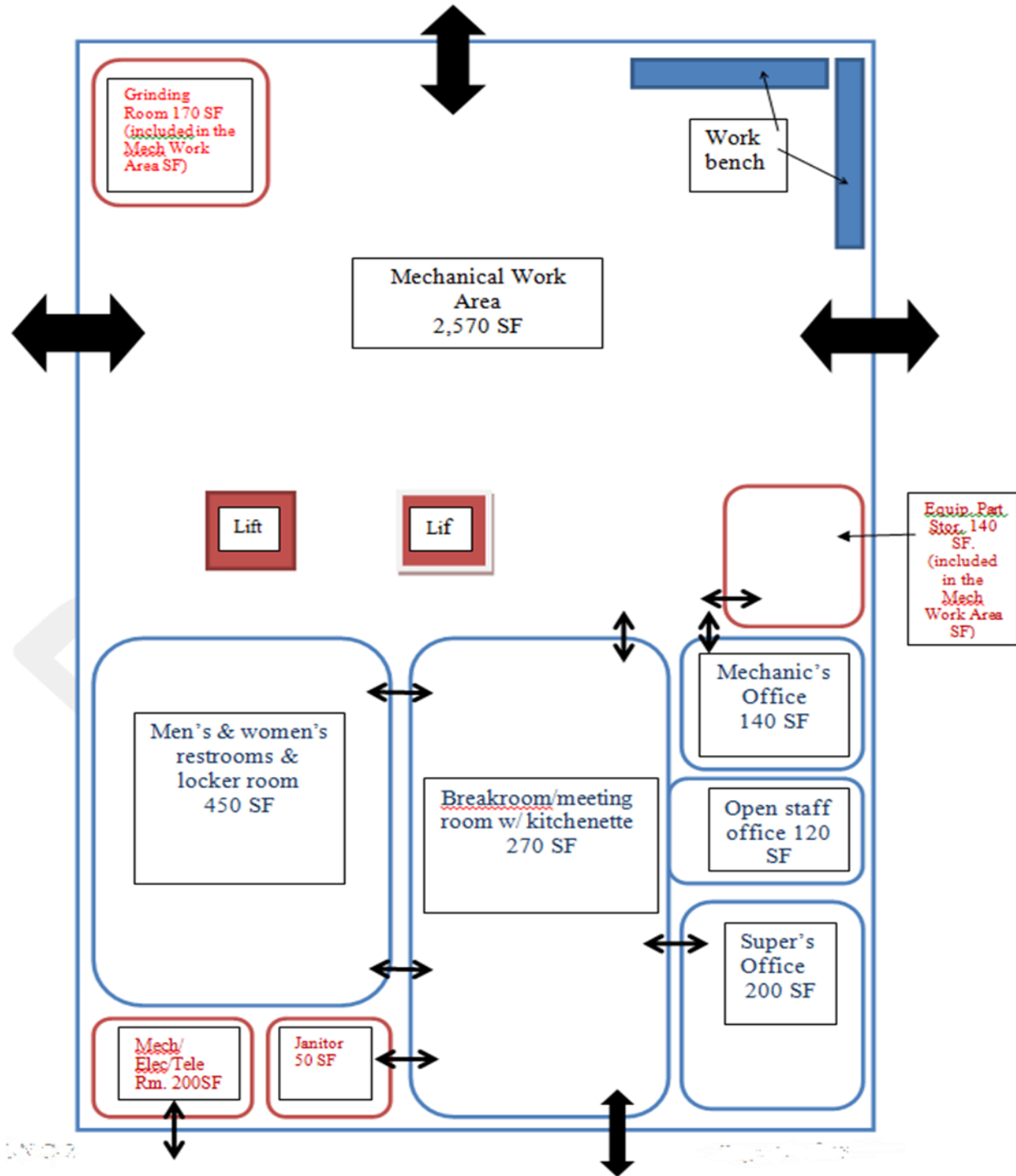
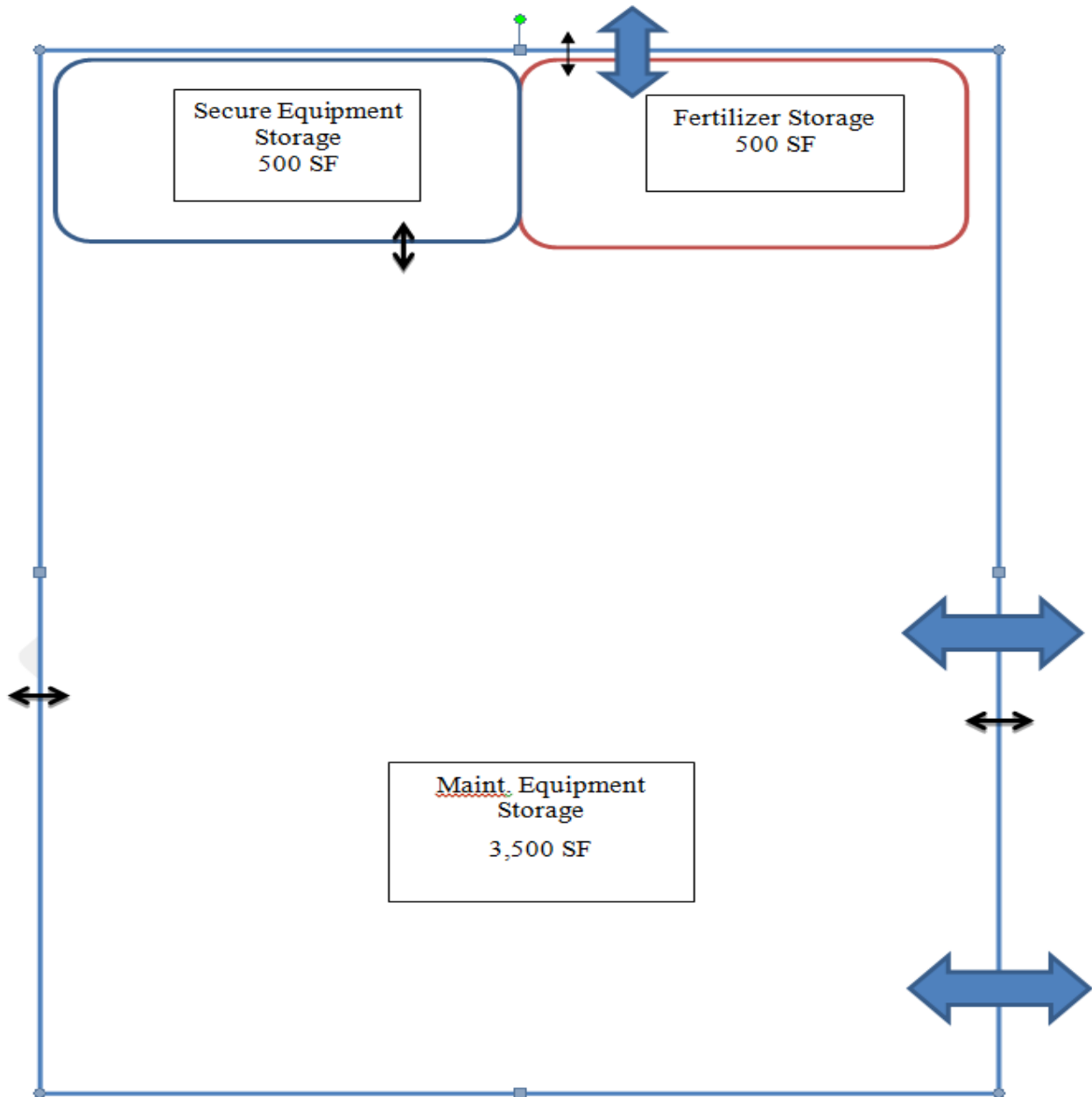


Figure 74480-2  
Storage Area Concept Diagram



## 750 COMMUNITY FACILITIES - MORALE, WELFARE AND RECREATION (OUTDOOR)

### 750-1 GENERAL

The Navy's Outdoor Recreation Program introduces Sailors and their families to lifetime outdoor recreation activities, and provides them with participation opportunities. The associated values and benefits of participating in outdoor-related activities effectively contribute to Navy quality of life and retention efforts. Outdoor recreation has long lasting, broad scope effects on other areas of a participant's life. Benefits include increased self-esteem, overall happiness and general well-being. The Outdoor Recreation Program promotes physical fitness, teamwork, leadership, skill development and environmental ethics. Examples of human powered outdoor recreation programs include:

Backpacking	Nordic Skiing	White Water Rafting
Canoeing	Rock Climbing	Scuba Diving
Sea Kayaking	Hiking	Orienteering
Snowshoeing	Mountain Biking	Surfing
Fishing	Camping	Alpine Skiing
Snowboarding	Rope Courses	Urban Bicycling
Adventure Races	In-line Skating	Adventure Travel
Skateboarding	BMX Biking	

The Outdoor Recreation Program also includes traditional outdoor recreation activities such as:

Golf	Basketball	Tennis
Volleyball	Baseball	Softball
Football	Soccer	Track and Field
Swimming	Sailing	

The extent and type of Outdoor Recreation Program depends on the Installation location, local geography, and patron interest. The 750 Series of Navy Category Codes provides for the various types of facilities that may be required to support the above programs. Facilities should be attractive, clean, uncluttered, and well maintained. Space should be available to support all core program activities.

**750-1.1 Morale Welfare and Recreation (MWR), Navy Personnel Command (NPC) Role:** The involvement of MWR representatives in the planning process is required, especially for all Category C business-based projects, in order to ensure a match between program needs, and the types and sizes of spaces to be provided. MWR programs are funded by a combination of non-appropriated funds (NAFs) and appropriated funds (APFs). MWR activities are divided into three categories following DoD policy on funding and function:

- **Category A** operations are authorized full APF funding and directly support mission essential requirements. Examples are gymnasiums, fitness centers, and sports programs.
- **Category B** operations are mission enhancing community support programs and are authorized significant APF support. Examples are outdoor recreation, child development, hobby shops, ITT, community pools, school age care, and youth development programs.
- **Category C** operations are business-based activities and are authorized minimal APF (such as SRM, environmental compliance, security, and health and safety support; interior renovation and new construction/additions are NAF funded) except at isolated/remote and OCONUS installations where Category C operations are treated the same as Category B operations. Examples are food and beverage operations, bowling centers, cottages, RV parks, slip rental marinas, and golf courses.

For Category B and C facilities an initial market survey and financial analysis or pro forma is required to determine if the facility will be self-sustaining or profitable, in the case of Category C operations. Once the Installation has completed their analysis, the proposal will be submitted via the regional command to NPC (after 1 October 2004, CNI Field Support Activity) through an Internal Needs Validation Study (INVS). If the project earns sufficient points through the INVS, it will move on to the Project Validation Assessment stage where the demand and scope will be confirmed through independent review.

750-1.4 **Overseas Adjustment:** For overseas activities the net to gross factor (typical net to gross is 1.25 or 25%) will increase as necessary to meet host nation building codes.

## 750-2 USING THE CRITERIA.

750-2.1 **Size to Accommodate Demand.** The below criteria provide the current approach for determining allowances for Morale, Welfare and Recreational (MWR) facilities. Facility allowances are sized to accommodate the projected demand for the anticipated functions. The projected demand will be estimated using a Market Survey approach. Existing Navy wide surveys (under 2 years old), MWR Pulse Point Surveys, and other local surveys can be used to determine the demand. Existing community facilities will be considered in the Market Analysis approach. The facility capacity requirements will be estimated using industry standards and comparable existing facilities, Navy, DoD, municipal, or commercial.

In addition to the above criteria, attention should be given to relevant planning information in the Base Master Plan, Regional or Functional Plan (RSIP), existing

Unified Facilities Criteria (UFC) as developed, Design Manuals, Military Handbooks or Instructions for the specific facility type.

For Marine Corps Installations results of the MWR Construction Program Patron Survey will be used to provide Marine Corps specific patron desires. Construction Program Patron Survey data is available from the Commandant of the Marine Corps (MW).

## 750-2.2 **Space Allowance Flexibility**

**750-2.2.1 Aggregate Space Allowances.** For many of these criteria, usage demand, capacity requirements and space allowances are calculated separately for component function-areas of the facility, and then totaled to derive overall facility space allowances. This procedure is designed to respond to local variations in the set of activities and spaces provided, and the relative demand for different activities depending on the needs of the installation population. This approach can also accommodate diverse existing facility situations, when considering additions or complementary new facilities.

**750-2.2.2 Space Programs versus Facility Allowances.** These criteria are used to determine the total space allowance for a facility. Even though area calculations for functional components of the facility are used in deriving the overall allowance, this does not fix the space sizes of the component program areas of the facility. Local installation decisions, in the space programming and design process, should determine the appropriate allocation of areas for each function-space within the total facility allowance. Any such decisions should be fully justified to the regional and CNI MWR program management to ensure compliance with Navy and DoD standards.

**750-2.2.3 Local Variation.** Local demand for program activities may depend on a variety of factors, in addition to the overall installation population, including

- Proportion and relative participation of different user groups among the population.
- Specific program of activities provided.
- Competing on-base and off-base facilities providing similar programs.
- Geographic distribution and accessibility of the user populations.
- Local climate conditions and operating seasons.
- Overseas situations and local customs.
- Installation geography.

**750-2.3** Population Basis for Demand Calculations

See Chapter 1 of this instruction for general information on population definitions and base loading data.

**750-2.4** Recreational Planning Context

Planning for MWR facilities should involve consideration of the individual facility in relationship to a comprehensive recreational program and facilities plan for the installation and the region. Consider the following factors, in addition to those relationships specifically indicated in the criteria for each facility:

- If other MWR facilities serving the same user population provide the same program activities, reduce the allowed capacity of the proposed facility by the capacity provided elsewhere at the installation or other nearby regional installations.
- Consider collocating the facility with other recreational facilities providing complementary programs, to provide the users with the increased convenience and attractiveness of clustered activities, and to take advantage of potential savings in support space requirements and operating costs.
- Size and locate an individual facility appropriately to the target population and geographical area its particular function is designed to serve. Convenient access for users should be considered in balance with the need for efficient facility operation and avoidance of duplicate facilities. Consider the DoD INST 1015.15 (Enclosure 3, Attachment 1) requirement for the use of appropriated funds (APF) for site development costs, archeological and ammunition clearances, water purification, demolition, excessive utility connections, and road service when selecting sites.
- Consider local community facilities. If the local community has a robust program and facilities for outdoor recreational activities consider partnerships with the local community for services, and/or other Public Private Venture initiatives.

**750 10 OUTDOOR PLAYING COURTS (EA)****FAC: 7521****BFR Required: Y**

Design Criteria: UFC 4-750-02N - Design: Outdoor Sports and Recreational Facilities

75010-1 **GENERAL.** See introduction to 750 series category codes for General Instructions regarding facility allowance planning procedures.

75010-2 **DEFINITION.** Outdoor Playing Courts provide facilities and support services to meet the individual physical fitness and recreation needs of military personnel. The facilities may also serve dependents, retirees and authorized civilians. Activities that may be accommodated in Outdoor Playing Courts include: basketball, tennis, volleyball, skate/skateboard parks, and outdoor skating/roller hockey rink

75010-3 **RELATED FACILITIES.** Consideration should be given to collocating the Outdoor Playing Courts with the following recreational facilities in order to (i) take advantage of potential savings in space requirements and operating costs, and (ii) provide users with the increased convenience of clustered facilities:

- 740 44 Indoor Physical Fitness Center (Gym)
- 740 45 Fitness Room
- 740 84 Indoor Playing Courts
- 750 20 Playing Fields
- 740 55 Youth Center

75010-4 **DEMAND AND ALLOWANCES.** Demand, market analysis and survey information, as well as the number of existing leagues/teams if applicable determine the number of Outdoor Playing Courts provided at each installation. Provision of lighted courts is recommended where there is a high demand and/or climate warrants later usage by patrons. Youth Outdoor Playing Courts will be provided as needed. They should be sized and located for the youth population, i.e. near the youth center if there is one. The Courts will be sized in accordance with industry standards for the youth age group or adult age group as appropriate.

## **750 20 PLAYING FIELDS (EA)**

**FAC: 7522**

**BFR Required: Y**

Design Criteria: UFC 4-750-02N - Design: Outdoor Sports and Recreational Facilities

75020-1 **GENERAL.** See introduction to 750 series category codes for General Instructions regarding facility allowance planning procedures.

75020-2 **DEFINITION.** Playing Fields provide facilities and support services to meet the individual physical fitness, coordination, skills development, training and recreation needs of military personnel. The facilities may also serve dependents, retirees and authorized civilians. Activities which may be accommodated in Playing Fields include: baseball, football, soccer, softball, track and field, etc.

75020-3 **RELATED FACILITIES.** Consideration should be given to collocating the Playing Fields with the following recreational facilities in order to (i) take advantage of potential savings in space requirements and operating costs, and (ii) provide users with the increased convenience of clustered facilities:



- 740 44 Indoor Physical Fitness Center (Gym)
- 740 45 Fitness Room
- 740 53 Indoor Swimming Pool
- 750 10 Outdoor Playing Courts.
- 740 55 Youth Center

75020-4      **DEMAND AND ALLOWANCES.** Demand, market analysis and survey information, as well as the number of existing leagues/teams if applicable determine the number of Outdoor Playing Fields provided at each installation. Provision of lighted fields is recommended for expanded usage. Provision of lighted fields and use of artificial turf or installed sprinkler systems may serve to reduce the total requirement for fields by allowing extended playing hours, extended play without the need for field maintenance/recovery. Youth Outdoor Playing Fields will be provided as needed. They should be sized and located for the youth population, i.e. near the youth center if there is one. The Fields will be sized in accordance with industry standards for the youth age group or adult age group as appropriate.

**750 21      BATTING CAGE (EA)**

**FAC: 7542**

**BFR Required: N**

75021-1      Batting cages may be provided at Installations where there is a demand, where a MWR survey supports the requirement, and there is no convenient local alternative. Size according to industry standards.

**750 22      JOGGING TRACK (KM/MI)**

**FAC: 7542**

**BFR Required: N**

75022-1      Jogging tracks are provided and sized as required.

**750 23      GO-CART TRACK (KM/MI)**

**FAC: 7542**

**BFR Required: N**

75023-1      Go-Cart Tracks may be provided as a Category C facility where they are determined to be profitable enterprises. Market analysis for this facility must be provided by MWR. Size according to demand and industry standards.

**750 30      OUTDOOR SWIMMING POOL - INSTALLATION (SQ.M./SF)**

**FAC: 7512**

**BFR Required: Y**

75030-1      (Use CC 740 53 SWIMMING POOL - INDOOR for sizing standards). With appropriate demand analysis, outdoor pools may include water park features and spray parks.

**750 33 POOL PUMP/FILTER/TREATMENT FACILITY (SF)****FAC: 7448****BFR Required: N**

75033-1 This code is for inventory purposes and only in those cases where such facilities are located in a structure remotely situated from the swimming pool proper.

**750 34 WADING POOL/SPLASH POOL (EA)**

**This CCN has been deleted. All newly programmed and existing assets should be assigned to CCN 75030 Outdoor Swimming Pool-Installation.**

**750 36 COOPER COAX CCTV AND CATV (LS)****FAC: 1351****BFR Required: N**

75036-1 This Category Code is for inventory purposes only. Such facilities are used for the distribution of CCTV, cable TV services and commercial internet services.

**750 37 OUTDOOR ADVENTURE AREA (EA)****FAC: 7542****BFR Required: N**

75037-1 Includes Ropes Courses, Natural Recreation Features (rock climbing, hiking trails, mountain bike trails, paintball ranges, and motocross/BMX areas). Requirement is based on local availability (geography) and local demand. Size according to industry standards.

**750 38 OUTDOOR MWR EQUIPMENT RENTAL STORAGE (SQ.M./SF)****FAC: 4521****BFR Required: Y**

75038-1 Outdoor fenced area with lighting for storage of MWR rental equipment (not enclosed). Facility should be co-located with the Outdoor Recreation Center CCN 740-37, if there is one.

**750 39 MWR VEHICLE/RV/BOAT STORAGE COMPOUND (SQ.M./SY)****FAC: 8523****BFR Required: Y**

75039-1 Vehicle/RV/Boat Storage Compounds may be provided as Category C facilities where they are determined to be profitable enterprises. Market analysis for this facility must be provided by MWR. Size according to demand and industry standards. Covered spaces may be included where justified by demand.

**750 40 GOLF COURSE (EA)****FAC: 7513****BFR Required: Y**

Design Criteria: UFC 4-750-02N - Design: Outdoor Sports and Recreational Facilities

75040-1 **GENERAL.** See introduction to 750 series category codes for General Instructions regarding facility allowance planning procedures.

75040-2 **DEFINITION.** Golf Courses are recreational facilities which may accommodate: recreational golfing, practice, instruction, tournaments, exhibitions, special events, and winter recreational activities such as cross-country skiing, ice skating, sledding and tobogganing. In addition to the Golf Course, space permitting, the facility may include a driving range, practice hole, chipping green with sand trap, and putting green(s). A Golf Course is a Category C MWR facility.

75040-3 **RELATED FACILITIES.** The Golf Course must be collocated with the following recreational facilities in order to (i) take advantage of potential savings in space requirements and operating costs, and (ii) provide users with the increased convenience of clustered facilities:

- 740 80 Golf Club House (including golf maintenance building/storage compound, chemical/fertilizer/pesticide storage and mixing building, and cart storage facilities).
- 750 56 Golf Driving Range.

75040-4 **DEMAND.** The Golf Course will be sized in accordance with a market survey approach. As a Category C facility the Golf Course must be profitable and a financial analysis or pro forma will be provided as well as the NPC Internal Needs Validation Study (INVS), and finally the Project Validation Assessment. The Planner will accomplish the initial demand investigation and review along with local MWR personnel. If project is financially sound it will be forwarded via the region to NPC (after 1 October 2004, CNI Field Support Activity) for INVS scoring and possible Project Validation Assessment.

75040-5 **FACILITY ALLOWANCE.** The Golf Course will be sized in accordance with industry standards. One resource for sizing criteria is the National Golf Foundation (NGF). Siting, water availability, and existing land area available will be the key considerations when planning a new Golf Course.

**750 50 OUTDOOR THEATER (EA)**

**FAC: 7532**

**BFR Required: Y**

75050-1 No planning factors are available. If an outdoor theater (either seat- type or drive-in) is provided, the requirements for theaters (Code 740 56) must be reduced accordingly.

**750 52 SKEET AND/OR TRAP RANGE (EA)**

**FAC: 7542**

**BFR Required: Y**

75052-1 Skeet and/or Trap Ranges may be provided as Category C facilities where they are determined to be profitable enterprises. Market analysis for this facility must be provided by MWR. Size according to demand and industry standards. In addition, suitable land must be available, and the activity must have a military population over 100. If a range building is authorized, see Category Code 740 52 for criteria. Table 75052-1 gives the corresponding land requirements. This facility must be self-sustaining.

**Table 75052-1. Land Requirements for Skeet and Trap Ranges Land Area**

Military Population (1)	Skeet Range	Trap Range
Up to 100	None	None
101 to 10,000	335m x 732m /1100' x 2400'	335m x 549m / 1100' x 1800'
10,001 to 15,000	335m x 732m /1100' x 2400'	335m x 576m / 1100' x 1890'
15,001 to 20,000	335m x 732m /1100' x 2400'	335m x 604m / 1100' x 1980'
20,001 to 25,000	335m x 732m /1100' x 2400'	335m x 631m / 1100' x 2070'
25,001 to 30,000	335m x 732m /1100' x 2400'	335m x 658m / 1100' x 2160'
30,001 to 40,000	335m x 777m /1100' x 2550'	335m x 686m / 1100' x 2250'
Over 40,000	335m x 823m / 1100' x 2700'	335m x 713m / 1100' x 2340'

(1) Military population consists of active duty military supported by the installation.

**750 54 BAND STAND (EA)**

**FAC: 7531**

**BFR Required: N**

75054-1 No planning factors are available. Requests for this facility will require individual justification.

**750 56 GOLF DRIVING RANGE (EA)**

**FAC: 7514**

**BFR Required: Y**

75056-1 Installations, where the necessary land is already available, and the facility will be profitable as a Category C facility, are authorized a golf driving range. See category code 750 40.

**750 57 MWR OPERATED RECREATION GROUNDS (EA)**

**FAC: 7516**

**BFR Required: Y**

75057-1 No specific guidance is available. Local conditions usually will govern the development of any parks, playgrounds, or picnic areas. Recreation Pavilions (Code 740 78) are authorized in conjunction with these facilities.

**750 58 RECREATIONAL CAMPGROUND-TENT (SQ.M./SF)**

This category code has been deleted. All newly programmed and existing assets should be assigned to category code 750 59, Recreational Campground.

**750 59 RECREATIONAL CAMPGROUND (AC)****FAC: 7541****BFR Required: Y**

75059-1 **GENERAL.** See General Notes to 750 series category codes for General Instructions regarding facility allowance planning procedures.

75059-2 **DEFINITION.** Recreational Campgrounds provide the military community with outdoor recreation opportunities at locations with attractive natural resources. To complement the camping experience, and depending on location, Recreational Campgrounds may offer activities such as boating, canoeing, fishing, hiking, hunting, skiing and swimming. Facilities should be designed to take advantage of the natural features of the site, from vegetation to good views to unusual topography. At the same time, development should be environmentally appropriate, and not threaten the preservation of the natural heritage and scenic resources.

The planning criteria in this Category Code addresses only the camping sites and other support elements such as RV dump stations; dumpster stations; playgrounds and courts (associated with the RV Park only); standalone picnic shelters; and any other associated facilities or site features other than buildings. Facilities such as camp offices; camp stores; bathhouses; laundry facilities; storage buildings; campground rental centers, etc. should be categorized under CCN 740-92 MWR RV Park Support Building. Requirements for these facilities can also be found under CCN 740-92. Recreational campgrounds are encouraged to make use of the Camp Host concept to assist in the management of the campground. Space allowances for MWR Rental Accommodations are addressed under CCN 740-81.

Dump stations should generally be provided at campgrounds that accommodate RV's. The sizing and design of dump stations will vary according to local conditions (such as topography, soil conditions, proximity to water sources, etc.). All dump station facilities must comply fully with all applicable environmental regulations.

75059-3 **RELATED FACILITIES.** Where such locations are adjacent to the sea or other body of water, support facilities such as marinas, boat ramps and RV/vehicle/boat storage compounds may be sited in close proximity to Recreational Campgrounds.

75059-4 **SPACE ALLOWANCE.** The total number of camping and/or RV sites provided at a location is primarily determined by two considerations:

- The Recreational Campground will be sized in accordance with a market survey approach. As a Category C facility the Campground must be profitable and a financial analysis or pro forma will be provided as well as the CNIC Internal Needs Validation Study (INVS), and finally the Project Validation Assessment. The Planner will accomplish the initial demand investigation and review along with local MWR personnel. If the project is financially sound it

will be forwarded via the region to CNIC Fleet & Family Readiness (N944A) for INVS Scoring and possible Project Validation Assessment.

- Capacity of the location to accommodate the proposed facilities at a recommended level of use density, and other site planning requirements for access and provision of utilities.

75059-4.1 The number of campsites which may be accommodated per acre will vary depending on the natural features (topography, geology, vegetation, etc.) of the proposed location and the desired degree of privacy between individual sites. Development of as few as 2.4 sites per hectare (6 sites per acre) to a maximum of 5.7 sites per hectare (14 sites per acre) is recommended as a planning guideline. However, this guideline may be modified by the financial analysis, which may, for example, indicate that 2.4 sites per hectare (6 sites per acre) may be too low to justify the investment required to provide the necessary infrastructure (paths, roads, patron support facilities, utilities, etc.). Furthermore, the financial analysis may also indicate a total minimum number of sites required to justify the investment in this recreational resource and the corresponding support building (CCN 740-92). RV Campsites should be planned with a vehicle/picnic pad 20 feet by 40 feet that will accommodate the RV and either towed or towing vehicle, picnic table, fire ring/grill and lantern pole. The adjacent utilities pedestal should offer 20/30/50A electrical service; drinking water hose bibb and sewer connection. WIFI service is also a standard for all RV spaces. Minimum separation between campsites should be 37 feet centerline to centerline of each pad. It is recommended that, where financially feasible, the RV Campground include a mix of back-in and pull-through sites.

75059-4.2 All facilities, which have the potential for causing environmental contamination — for example, dumpsters and dump stations —, must comply fully with all applicable local, state and federal regulations. The planning of Recreational Campgrounds located in areas under the jurisdiction of other agencies such as State Parks and Forests Divisions, the U.S. Forest Service and the National Park Service, must adhere to all applicable development guidelines and review procedures.

## **750 60 MARINA / BOAT RAMP (EA)**

**FAC: 7518**

**BFR Required: Y**

75060-1 This facility requires special considerations and must be developed based on local conditions and supported by a detailed analysis. As a Category C facility, the Marina must be profitable and a financial analysis or pro forma will be provided as well as the CNIC Fleet & Family Readiness (N944A) Internal Needs Validation Study (INVS), and finally the Project Validation Assessment (PVA). A marina may also be operated as a Category B operation without resale or private boat berthing. In this case, boats and equipment are MWR-owned and -operated. For a Category B program marina, it is necessary to document the demand and to ensure that APF will be available to support operation of the sailing program. In this case the INVS and PVA goal is to build only to

demand capacity and attempt to breakeven financially. The operation of a snack bar, restaurant, or resale outlet is only authorized as a Category C program. The Planner will accomplish the initial demand investigation and review along with local MWR personnel. If the project is financially sound it will be forwarded via the Region to CNIC Fleet & Family Readiness (N944A) with a pre-INVS for evaluation, comment and questions. Once any comments or questions are resolved submission of a full INVS will be invited and scored followed by a possible PVA. CCN 75060 Marina/Boat Ramp includes any combination of boat launch ramps for personal watercraft; boat launch piers that support the ramp; and/or any piers associated with boat slips. Stand-alone recreational piers not affiliated with a marina should be captured under CCN 75061 Recreational Pier. A marina support building or boathouse is authorized in conjunction with a marina and should be programmed as a part of the project nomination and validation process. See category code 74087, Marina Support Building, for marina support building criteria. There are two categories of Marina: Category B is the MWR boating/sailing program and Category C is the rental slip operation.

#### **750 61 RECREATIONAL PIER (EA)**

**FAC: 7517**

**BFR Required: Y**

75061-1 This CCN is used for stand-alone recreational pier facilities (e.g. fishing piers) where there is no existing Marina.

### **751 OUTDOOR RECREATION FACILITIES**

#### **751 10 PLAYGROUND (EA)**

**FAC: 7511**

**BFR Required: N**

75110-1 **DEFINITION.** Formerly titled "Community Playground". Playgrounds are outdoor activity areas provided for children and are an integral part of the functions associated with schools, family housing areas, outdoor athletic and recreational areas, and child development, school age care and youth centers. The playgrounds may utilize traditional playground equipment or may be constructed with zero-depth splash park features.

A playground will have a defined boundary with one or more types of play equipment or features, and fall-protection surfacing appropriate for the equipment provided and anticipated activities. (A playground is differentiated from an open play area which does not have a defined boundary or engineered surfacing, which generally consists of a rubberized, poured surface but may be wood chips, rubber chips, or rubber tiles).



Each playground is specifically planned and designed to meet the age-appropriate activity needs of children playing in these areas. Refer to UFC 3-201-02 "Landscape Architecture" and the US Consumer Product Safety Commission "Public Playground Safety Handbook" for guidance.

Each playground must be Architectural Barriers Act (ABA) compliant for the appropriate age group. For Child Development Centers having multiple outdoor activity areas for each age group, only a single area per age group must be ABA compliant, however all outdoor activity areas must meet the requirements of the Child Development Center UFC 4-740-14. Outdoor activity areas supporting Youth or School Age Care (SAC) Centers must comply with UFC 4-740-06.

Playgrounds do not include purpose-built fields or tracks to support specific sports (refer to the 750 series of Category Codes for sports facilities).

75110-2 **PROPERTY RECORD CARD USAGE.** Each playground location should be shown on a separate property record card, which will include the site and all equipment associated with the playground.

This Category Code is for inventory purposes only.

## **752 OUTDOOR ATHLETIC FACILITIES**

### **752 40 ATHLETIC STADIUM (EA)**

**FAC: 7524**

**BFR Required: N**

75240-1 For inventory purposes only.

## **760 MUSEUMS AND MEMORIALS**

### **760 10 MUSEUM / MEMORIAL BUILDING (SQ.M./SF)**

**FAC: 7601**

**BFR Required: Y**

Project Approval (Museums): Assistant Secretary SECNAV INSTRUCTION 5755.2A (Museums) ([http://neds.nebt.daps.mil/Directives/5755\\_2a.pdf](http://neds.nebt.daps.mil/Directives/5755_2a.pdf))

76010-1 No specific planning factors are available for this group. Requirements for each of the above facilities will be established based on individual studies and supporting justification. Museums must be approved by SECNAV.

76010-2 The Office of the Comptroller of the Navy has ruled the use of appropriated funds (including OM&N funds) for the construction and maintenance of memorials is restricted to those memorials specifically approved by Congressional authority. Alternative funding sources should be explored.

**760 20 OUTDOOR MONUMENT / MEMORIAL (EA)**

**FAC: 7602**

**BFR Required: N**

76020-1 The Office of the Comptroller of the Navy has ruled that the use of appropriated funds (including OM&N funds) for the construction and maintenance of memorials is restricted to those memorials specifically approved by Congressional authority. Alternative funding sources should be explored.

**760 30 CEMETERY (EA)**

**FAC: 7603**

**BFR Required: N**

76030-1 No specific planning factors are available for this group. Requirements for each of the above facilities will be established based on individual studies and supporting justification. SECNAV approval will be required.

**FACILITIES CRITERIA (FC)**  
**FACILITY PLANNING FOR NAVY AND**  
**MARINE CORPS SHORE INSTALLATIONS**

**Series 800: UTILITIES AND GROUND IMPROVEMENTS FACILITIES**

**Record of Changes:**

<b>Date</b>	<b>CCN</b>	<b>CCN Title</b>	<b>Description of Change</b>
13 June 2018	83143	Hazardous Waste Storage Building	Remapped to FAC 4423 per OSD/RPCP FY18.
13 June 2018	892 Series	NA	Added 892 Series "Miscellaneous Utilities-Each"
13 June 2018	89210	Monitoring Wells	CCN added
24 Oct 2018	82112 82122 82130 82140 82310	Heating Plant - Oil / Gas Heating Plant - Coal Heating Plant - Non - Fossil Fuel Steam Plant – Nuclear Gas Generating Plant	Changed Unit of Measure from millions of BTU per hour (MB) to BTU per hour (BH)
28 Jan 2020	81220	Exterior Lighting, Pole Mounted	Title changed from "Street Lighting" to "Exterior Lighting, Pole Mounted". Primary unit of measure changed from LF to EA.
28 Jan 2020	81240	Perimeter and Security Lighting	CCN 81240 deleted in FY19. Assets consolidated into CCN 81220.
28 Jan 2020	83340	Garbage House/Recycle Center Building	Title changed from "Garbage House" to "Garbage House/Recycle Center Building".
28 Jan 2020	85215	Bicycle Shelter	Title changed from "Parking Building, Bicycle" to "Bicycle Shelter". FAC Code changed from 8531 to 7384.
28 Jan 2020	89045	Valve House or Other Enclosure	Title changed from "Valve House or Other Shed/Shelter" to "Valve House or Other Enclosure".
28 Jan 2020	89210	Monitoring Wells	FAC Code changed from 1499 to 8840.
28 Jan 2020	87110	Storm Sewer	FAC Code changed from 8321 to 8711

<b>Date</b>	<b>CCN</b>	<b>CCN Title</b>	<b>Description of Change</b>
28 Jan 2020	81340	Lightning Protection System, Standalone	Added category code 81340 – Lightning Protection System
20 July 2020	85210	Parking Area	Updated Table 85210-1, Allowances for Non-Organizational Vehicle Parking
20 July 2020	82140	Steam Plant-Nuclear	CCN deleted
20 July 2020	83142	Hazardous Waste Storage Area	FAC code changed from 8926 to 8526
20 July 2020	83231	Sewage Lift Stations	CCN deleted. Redundant. Use 83230.
12 Mar 2021	81220	Exterior Lighting, Pole Mounted	Removed conflicting statement regarding units of measure.
24 Aug 2021	87210	Station Security and Perimeter Fencing and Walls	Added Security Fencing for Magazine Storage and Security Risk (SRC) Categories I and II ordnance.
31 Aug 2021	84441	Stormwater Filtration – Permeable Surface	New Category Code added.
31 Aug 2021	84442	Stormwater Filtration - Swales	New Category Code added.
31 Aug 2021	84451	Stormwater Treatment Structure	New Category Code added.
11 Nov 2021	84420	Water Well	Note that the Real Property Categorization Panel will change the FAC to 8414. Change CCN 84420 title to "Water Well" and change CCN definition information to include the words "either potable or non-potable."
11 Nov 2021	81340	Lightning Protection System, Standalone	Change definition verbiage.
11 Nov 2021	85235	Other Paved Areas Not Coded In The 100 or 400 Series	CCN definition change only. Removes term "vehicular" from original description.
11 Nov 2021	85240	Miscellaneous Open Storage or Laydown Area – Paved	Change title to add word "Paved"
11 Nov 2021	83320	Garbage Grinder Building	Note that the Real Property Categorization Panel will change the FAC to 8330. Change Unit of Measure (UM) to SF Delete outdated definition and include new information regarding refuse and recycling.

<b>Date</b>	<b>CCN</b>	<b>CCN Title</b>	<b>Description of Change</b>
19 August 2022	83312	Refuse/Solid Waste Collection Facility – (Non Hazardous)	Add new category code.
19 August 2022	85239	Miscellaneous Open Storage or Laydown Area - Unpaved	Add new category code.
12 September 2022	85240	Miscellaneous Open Storage or Laydown Area - Paved	In section 85240-1, Reference the use of Table 85240-1 in lieu of Table 852 40.
6 October 2022	81240	Level 1 / Level 2 Electric Vehicle Charging Facility	Add new category code.
	81241	Level 3 Direct Current Fast Charging Facility	Add new category code.
2 Mar 2023	800 Series	UFC 2-000-05N	Change UFC 2-000-05N to FC 2-000-05N document due to the fact that this planning criteria is not unified among the other DoD services.
15 June 2023	81240	Level 1 / Level 2 Electric Vehicle Charging Facility	Add requirement for electric charging capability to support no less than 15 percent of Government motor vehicles.
	81241	Level 3 Direct Current Fast Charging Facility	
15 Jan 2024	87250	Entry Gate	Add new category code.
15 Jan 2024	89018	Utility Vault-Non Communications	Modify category code description.
15 Jan 2024	89046	Utility Tunnel-Non Communications	Modify the category code title and description.
15 Jan 2024	89210	Monitoring Well	Modify the category code description.
15 Jan 2024	89320	Utility Channel-Non Communications	Modify the category code title and description.
27 Feb 2024	81340	Lightning Protection System, Standalone	Change “DEFINITION” and PROPERTY RECORD CARD USAGE” sections to 81340-1 and 81340-2, respectively.
12 Mar 2024	83230	Sewage Waste Pumping Station	Change the word “PUMP” in the title to “PUMPING.” Change the primary unit of measure from EA to KG, which is equivalent to “Thousand Gallons per Day (KG).”

## 800 SERIES UTILITIES AND GROUND IMPROVEMENTS FACILITIES

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## 810 ELECTRIC POWER

### 810-1 DEFINITION

The electric power demand of a Navy or Marine Corps installation will normally be predicated upon an engineering study of personnel and industrial-type consumption load of the installation activities. However, in the absence of an engineering study the following should be utilized for broad planning purposes:

**Table 810-1. Electric Demand Planning Factors**

Category Group	Description	Unit of Measure	Maximum Demand Per Unit of Measure (Watts)
130	Communication & Navigational Aid	SF	13, 5
	Airfield Lighting	LF	6
140	Land Operations Facilities	SF	7.5
150	Waterfront Operational Facilities	SF FB	5 $5 \times 10^3$
170	Training Facilities	SF	7.5
210	Maintenance, Shops & Facilities	SF	7.5
220	Production Buildings, & Plants	SF	7.5
310	Research, Development & Test Bldg.	SF	7.5
440	Storage, Covered	SF	2
510/20	Hospital Buildings	SF BD	6 $4 \times 10^3$
230/40/50	Labs, Clinics, Dispensaries	SF	8
610	Administration Buildings	SF	6
710	Family Housing	SF FA	4.5* $6 \times 10^{3*}$
720	Troop Housing	SF MN	5.5 500
730/40	Community Facilities	SF	7
821	Heating Plants	SF MBH	5 $3 \times 10^3$
830	Sewage Treatment Plants	MGPD	$200 \times 10^3$

\* Coincident demand for multiple units.

## 811 ELECTRIC POWER-SOURCE

**811-1 DEFINITION.** Electric power for base facilities is normally derived from local commercial sources. Where commercial sources are used, transformer substations are required to transform the electrical energy to satisfy the station's load requirement.

Category Code Numbers (CCNs) 81110, 81125, 81145, 81146, and 81150 power generation plants may be used as a primary power source in lieu of commercial power or for reducing dependency on commercial power. CCN 81160 may only be used for standby power generation plants.

Primary power generation plants are real property. Standby generator plants may be real or personal property, depending on what they support. In general, a standby generator shall be considered real property if it supports real property and shall be considered personal property if it supports personal property. See [OPNAVINST 11010.20H](#), Chapter 1, Paragraph 2c for definitions of real property and personal property.

**811-2 PROPERTY RECORD CARD.** Regardless of whether the real property power plant is within the footprint of another building, in a standalone building, sheltered by a structure or on a pad, or if it is generating primary or auxiliary power, the primary power or standby power generator plant is assigned its own property record card. If the power plant is located within a standalone building, use CCN 81109 for primary power plants or CCN 81159 for standby power plants.

### 811 09 ELECTRIC POWER PLANT BUILDING (SF)

FAC 8910

BFR Required: N

Revised: August 2015

**81109-1 DEFINITION.** This category code is used for the buildings or shelters that house the electric power plant and associated equipment included in category codes 81110, 81125, 81145, 81146, 81150 and 81160. If an access road is required, the road is inventoried separately; see 85110 and 85111 for more information.

**81109-2 PROPERTY RECORD CARD USAGE.** Each electric power plant building, shelter or pad should be captured on a single, individual property record card as a structure. If a separate standalone building is used, then CCN 81109 should be assigned as the utilization on that property record card. If the power generation plant is housed in an existing multi-purpose facility, then the space used for the power generation plant should be assigned a utilization of 81109.

**811 10 - 811 50 ELECTRIC POWER PLANTS**

**81110/81150 – 1 DEFINITION.** Consideration as to whether an electric power generating plant is to be planned will depend on the station's geographical location, the availability of a firm uninterrupted adequate power supply from a local electric utility, the economics of using byproduct steam for space heating and industrial process work, and the availability of the required fuel. The electric generating plant (diesel or steam) shall have a total installed capacity equal to the station's total kilowatt demand and in the case of diesel generators there must be one additional standby generating unit with a capacity equal to the largest unit on the line.

In the planning and determination of power plant capacity, due consideration should be given to the estimated demand of all of the station's consumption, both domestic and industrial, plus the anticipated load growth. For initial planning purposes, power plant capacity may be computed by either (1) utilizing the factors indicated under 810 above, or (2) totaling all of the estimated demands in kilowatts of all existing and proposed station buildings and multiplying this total by an appropriate diversity factor. Where a diversity factor is not provided, a factor of eighty percent (80%) may be used. The resultant total is the estimated power plant capacity or the estimated amount of electrical power needed by the station facilities.

**811 10 ELECTRIC POWER PLANT - DIESEL (KW)****FAC 8111****BFR Required: N****Revised: August 2015**

**81110-1 DEFINITION.** This category code is used for power plants that use diesel generators as the primary power source for the production of electricity. Additionally, these plants may also be used in auxiliary capacity for peak shaving or other energy reduction. This category includes all necessary equipment for the production of the commodity including fuel tanks, pumps, electrical equipment, plant controls, and all required process equipment for commodity generation. Dual-fuel engines and piston engines utilizing natural gas or other alternate fuels will use this category code.

**81110-2 PROPERTY RECORD CARD USAGE.** All equipment is inclusive to the power generation plant and shall not be accounted for separately. The power generation plant should be captured on a single, individual property record card. Any switching stations or substations located inside or outside the power plant but associated with the power distribution system of the installation should be shown on a separate property record card. The building that houses the power plant should be reflected on a separate property record card; see 81109 for more information.

**811 25 ELECTRIC POWER PLANT - STEAM TURBINE (KW)**

FAC 8111

BFR Required: N

Revised: August 2015

**81125-1 DEFINITION.** A central plant using steam turbine generators for the production of electricity. This category includes all necessary equipment for the production of the commodity. Included are fuel tanks, pumps, electrical equipment, and all required process equipment for commodity generation. The primary unit of measure is kilowatts of generation installed (KW). **NOTE:** All cogeneration plants should be classified using Category Code 81125. A steam turbine typically uses coal, natural gas, or fuel oil, but could also use refuse or a nuclear energy source. Each of these fuel sources has differing components and storage requirements that would be noted during an asset evaluation, but that are considered real property installed equipment (RPIE) of the plant and not called out as separate facilities (e.g., a conveyor system for delivery of coal or storage tanks for fuel).

**81125-2 PROPERTY RECORD CARD USAGE.** All equipment internal to the power plant shall be included on an individual property record card. Any switching stations or substations located inside or outside the power plant that are associated with the power distribution system of the installation should be shown on a separate property record card. The building that houses the power plant should be on a separate property record card using CCN 81109.

**811 45 ELECTRIC POWER PLANT - GAS TURBINE (KW)**

FAC 8111

BFR Required: N

Revised: August 2015

**81145-1 DEFINITION.** A central plant using gas fired turbine generators for the production of electricity. This category includes all necessary equipment for the production of the commodity. Included are fuel tanks, pumps, electrical equipment, and all required process equipment for commodity generation. The primary unit of measure is kilowatts of generation installed (KW). A gas turbine is typically run off of a jet propellant (JP) fuel source. Gas turbines are a source of primary power and are classified as real property.

**81145-2 PROPERTY RECORD CARD USAGE.** All equipment internal to the power plant should be included on a single, individual property record card. Any switching stations or substations located inside or outside the power plant but associated with the power distribution system of the installation should be shown on a separate property record card.



**811 46 ELECTRIC POWER PLANT - WIND TURBINE (KW)****FAC 8114****BFR Required: N****Revised: August 2015**

**81146-1 DEFINITION.** A central plant using wind turbines for the production of electricity. This category includes all necessary equipment for commodity generation. The primary unit of measure is kilowatts of generation installed (KW). These plants generate electricity by capturing the kinetic energy of the wind to drive the turbine. This power generation source is a form of renewable energy and is primarily used for energy reduction. Wind turbines are a passive source of primary power and shall be considered real property.

**81146-2 PROPERTY RECORD CARD USAGE.** The equipment internal to the power plant should be included on an individual property record. Any switching stations or substations associated with the power distribution system of the installation should be shown on a separate property record card.

**811 50 ELECTRIC POWER - PHOTOVOLTAIC SYSTEM (KW)****FAC 8115****BFR Required: N****Revised: August 2015**

**81150-1 DEFINITION.** A power source using photovoltaic (PV) panels for the production of electricity. This category code includes all necessary equipment for the production of the commodity. These plants generate electrical power by converting sunlight into direct current electricity using semiconducting panels. This power generation source is a form of renewable energy and is primarily used for energy reduction. PV systems are a passive source of primary power and are classified as real property.

**81150-2 PROPERTY RECORD CARD USAGE.** All photovoltaic systems are classified as real property and inventoried in iNFADS. All equipment associated with a photovoltaic system shall be included on a single property record card. The primary unit of measure is the rated output capacity of the inverter in kilowatts (KW) generated by the PV system. Note that roof top mounted units are typically maintained by the tenant command, whereas carport mounted and/or ground mounted units are maintained by the public works utilities department.

**811 59 STANDBY GENERATOR BUILDING (SF)****FAC 8910****BFR Required: N****Revised: August 2015**

**81159-1 DEFINITION.** This category code is used for standalone buildings associated with emergency standby generator plants (81160).

**81159-2 PROPERTY RECORD CARD USAGE.** Each building shall be recorded on an individual property record card. All equipment associated with a standby generator plant shall be included on a separate property record card utilizing CCN 81160.

## **811 60 STANDBY GENERATOR PLANT (KW)**

**FAC 8112**

**BFR Required: N**

**Revised: August 2015**

**81160-1 DEFINITION.** Standby generator plants include all necessary equipment for the production of power. Such equipment may include day tanks, pumps, power panels, switchgear, controls, battery storage, and automated transfer switches. When dealing with standby generator plants, it is necessary to verify the characteristics of the plant with appropriate facility POC to ensure accuracy of real property status and rated capacity (KW).

There are several categories of standby generator plants:

- a. Utilities Standby Power - Utilities standby power generation plants act as auxiliary sources of power and do not require full-time operation. Utilities standby generation plants serve utility production and distribution facilities such as water treatment plants or sewage lift stations, during power outages. Utilities standby power generation plants are classified as real property.
- b. Emergency Standby Power - Emergency standby power generation plants provide power upon loss of the primary power source and are classified as Emergency Systems by NFPA 70. They are essential for safety to human life and legally required by municipal, state, federal or other codes or by a governmental agency having jurisdiction. Examples include generators for hospitals or air traffic control towers. Emergency standby power generation plants are classified as real property.
- c. Mission Specific Standby Power – Mission specific standby power generation plants support mission specific operations. These essential loads must be supported with emergency standby power generation and provide an adequate uninterrupted power supply in the event (and throughout the period) of power outages and other emergencies. There are two types of mission specific standby power.
  1. Where an entire operation must be supported with power, (such as a command operation center, SCIF, or other mission essential operation), these mission specific standby power generators may support a single

building, multiple buildings or a space within the building. Since these generators are supporting a real property, these mission specific standby power generators and associated UPS systems would be classified as real property.

2. Where only critical personal property equipment such as servers, computer room air conditioning (CRAC) units or other telecommunication gear is supported, these generators and associated UPS will be classified as personal property. In these instances, the generators are sized only to support specific critical pieces of personal property equipment. These generators would not be used for building system or task lighting, central or comfort air conditioning system, or power to support personnel operations.

**81160-2 PROPERTY RECORD CARD USAGE.** A real property standby generator plant should be inventoried on its own property record card. The associated plant equipment (day tanks, UPS, battery bank, transfer switch, etc.) is classified as Real Property Installed Equipment (RPIE) and should not be inventoried separately. Bulk fuel storage tanks must be inventoried separately. Whether real or personal property, in many instances CNIC will not be owner or operator of the standby generator plant and the maintenance fund source codes will vary accordingly. There are many possible owner-operators that could have maintenance responsibility, including CNIC, NAVAIR, NAVFAC, or other non-Navy tenant command such as DLA or BUMED. The primary unit of measure is the rated capacity in kilowatts (KW) generated.

## **812 ELECTRIC POWER TRANSMISSION AND DISTRIBUTION LINES**

**812-1 DEFINITION.** Distribution and transmission lines are required to supply electricity to buildings, street lighting, floodlighting, and perimeter lighting. Lines may be either overhead or underground and will include poles, duct banks, and controls to distribute electrical energy from the source to each using facility. Planning for distribution and transmission lines will require engineering calculation of critical power demand loads and future load growth. Airfield pavement lighting is planned as described under Category Code 136.

### **812 09 ELECTRIC DISTRIBUTION BUILDING (SF) FAC 8910 BFR Required N**

**81209-1 DEFINITION.** This category code should be used for buildings associated with electric distribution system that are not included under Switching

Station/Substation buildings, Category Code 813 10. This Category Code will rarely be used. The unit of measure is square feet.

**81209 – 2 PROPERTY RECORD CARD USAGE.** Each building should be on a single property record card.

## **812 12 TRANSFORMERS (KV)**

**FAC 8133**

**BFR Required N**

**81212-1 DEFINITION.** Transformers transform electrical power on the primary side to a lower or higher voltage on the secondary side to serve a facility or several facilities. Use the kilovolt ampere (KVA) rating that is found on the nameplate on the transformer or obtained from the manufacturer. It is the lowest rating when multiple ratings are provided (i.e. 12000/16000/20000 – OA/FA/FOA)]. The primary unit of measure is kilovolt ampere (KV) and the alternate unit of measure of EA should be entered into iNFADS. Enter the alternate unit of measure, each (EA), by including the total quantity of transformers listed on the record.

**81212-2 PROPERTY RECORD CARD USAGE.** A separate property record card shall be created which aggregates all distribution transformers in each special area of an installation, separated by voltage class and also separated by those transformers connected to the overhead distribution system and the underground distribution system. A detailed list of individual transformers totaled on the property record card should be kept in Maximo or by another method (e.g. Excel) and the file attached to the property record card.

Example: Transformers on a 15 KV system will be shown on separate property record cards, one PRC for the overhead distribution system, and one PRC for the underground system for each special area of the installation. If there are 40-500 KVA transformers on a 15 KV overhead electric distribution system, the property record card should reflect a total adequate other measure of 20,000 KVA.

## **812 20 EXTERIOR LIGHTING, POLE MOUNTED (EA)**

**FAC 8122**

**BFR Required N**

**81220-1 DEFINITION.** A utility consisting of secondary power distribution lines (either above or below ground), exterior light fixtures, and poles or standards for mounting the fixtures. This utility includes all forms of exterior lighting (other than that mounted on buildings or other facilities), including that for airfield perimeter lighting; street lighting for traffic circulation; parking lot lighting for traffic circulation, personnel safety, and security; area lighting for personnel safety, security, and night-time use of facilities; and security lighting for arms and ammunition storage areas or facilities,

airfield or heliport perimeters, or other mission-essential vulnerable areas. The primary unit of measure is each pole (EA).

**NOTE:** Pole-mounted floodlighting systems associated with athletic fields are already accounted for under CCN 75020 Playing Fields. For Traffic Control Signals, use CCN 85123.

**81220-2 PROPERTY RECORD CARD USAGE.** A separate property record card shall be created for each special area of an installation.

## **812 31 OVERHEAD ELECTRICAL DISTRIBUTION LINES (LF)**

**FAC 8121**

**BFR Required N**

**81231-1 DEFINITION.** The overhead lines are for the transmission of electrical power between source, substations and switching stations, and end users. Includes all required wire, poles, pole mounted switches, supports, insulation, metering, etc.(Excluding transformers and sectionalizing switches) necessary for a complete and useable distribution system.

Other Unit of Measure - linear feet of circuit [pole-to-pole distance X number of circuits on pole, NOT number of wires] (LF). Example: A span of electrical overhead distribution 1500 feet in length supporting 2 circuits would be 1500 ft X 2 circuits = 3000 linear feet.

**81231-2 PROPERTY RECORD CARD USAGE.** A separate property record card shall be created for each special area of an installation for each voltage class.

## **812 32 UNDERGROUND ELECTRICAL DISTRIBUTION LINES (LF)**

**FAC 8123**

**BFR Required N**

**81232-1 DEFINITION.** The underground lines are for the transmission of electrical power between source, substations and switching stations, and end users. It includes all required cable, conduit, duct bank, manholes, switches, insulation, metering, etc. (Excluding transformers and sectionalizing switches) necessary for a complete and useable distribution system.

Other Unit of Measure - linear feet of circuit [manhole-to-manhole distance and pole-to-manhole distance X number of circuits NOT number of cables] (LF). Example: 1000 feet of cable run in duct bank containing 4 circuits would be 1000 ft X 4 circuits = 4000 linear feet.

**81232-2 PROPERTY RECORD CARD USAGE.** A separate property record card shall be created for each special area of an installation for each voltage class.

**812 40      LEVEL 1 / LEVEL 2 ELECTRIC VEHICLE CHARGING FACILITY (KW)****FAC 8124****BFR Required N**

**81240-1      DEFINITION.** An electric vehicle (EV) charging facility delivers either a 120V or 208/240V AC power for charging government-owned vehicles and/or personally-owned vehicles at an installation.

**81240-2      PARKING REQUIREMENT.** Provide adequate electric charging capability concurrently for no less than 15 percent of Government motor vehicles planned for parking at a facility (See UFC 2-100-01 DOD Building Code).

**81240-3      PROPERTY RECORD CARD USAGE.** EVCFs are permanently constructed to include charging stations (ports), electric meters, associated electrical service lines and conduits, dedicated transformers, and concrete pads/footings as required.

The unit of measure (UM) of EVCF systems is kilowatt (KW) and is cumulative for each charging port station associated with the asset.

Example: A row of five charging stations (ports) is considered a single asset with a unit of measure equal to the sum of each port's KW output.

**812 41      LEVEL 3 DIRECT CURRENT FAST CHARGING FACILITY (KW)****FAC 8124****BFR Required N**

**81241-1      DEFINITION.** An electric vehicle (EV) charging facility delivers 50kW-400kW DC power for charging government-owned vehicles and/or personally-owned vehicles at an installation.

**81241-2      PARKING REQUIREMENT.** Provide adequate electric charging capability concurrently for no less than 15 percent of Government motor vehicles planned for parking at a facility (See UFC 2-100-01 DOD Building Code).

**81241-3      PROPERTY RECORD CARD USAGE.** EVCFs are considered real property when they are constructed as a charging system. EVCFs are permanently constructed to include charging stations (ports), electric meters, associated electrical service lines and conduits, dedicated transformers, and concrete pads/footings as required.

The unit of measure (UM) of EVCF systems is kilowatt (KW) and is cumulative for each charging port station associated with the asset.

Example: A row of five charging stations (ports) is considered a single asset with a unit of measure equal to the sum of each port's KW output.

## **813 ELECTRIC POWER SUBSTATIONS AND SWITCHING STATIONS**

### **813 10 SWITCHING STATION / SUBSTATION BUILDING (SF) FAC 8910 BFR Required N**

**81310-1 DEFINITION.** This Category Code is used for the buildings associated with a substation or switching station (813 20 or 813 30). These are the buildings that contain the switchgear, batteries, charging panels and other equipment located within the substation or switching station.

**81310-2 PROPERTY RECORD CARD USAGE.** A separate property record card shall be created for each building.

### **813 20 SUBSTATIONS (KV) FAC 8131 BFR Required N**

**81320-1 DEFINITION.** Distribution substations, normally consisting of transformers and their associated switchgear, structures, buses, grounding systems, and protective devices; transform electrical power to a lower or higher voltage and put it on the distribution system. This category code shall also be used for unit substations. A unit substation is defined as consisting of one or more transformers, an incoming primary section and a transition section (connected to secondary switchgear). The unit substation may be connected to the electrical distribution system of the activity or to the electrical distribution system of one or more facilities. The rated capacity of the substation or unit substation is the sum of all distribution transformers in the substation. The unit of measure is kilovolt ampere (KV). This rating is found on the nameplate on the transformer or obtained from the manufacturer. It is the lowest rating when multiple ratings are provided (i.e. 12000/16000/20000 KVA – OA/FA/FOA)]

**81240-2 PROPERTY RECORD CARD USAGE.** Each distribution substation shall be listed on a separate property record card. All unit substations shall be aggregated separately by voltage class (high side of the transformer) and by overhead and underground distribution systems, for each special area. A detailed list of individual unit

substations combined on the property record card should be kept in Maximo or by another method (i.e. Excel) and the file attached to the property record card.

Example: Five unit substations of 1,500 KVA each on the underground distribution system at NWS Yorktown – Main Base would be aggregated on a single property record card using CCN 813 20 with a total value of 6,000 KVA.

## **813 30 SWITCHING STATION FOR SECTIONALIZED DISTRIBUTION CIRCUITS (KV)**

**FAC 8132**

**BFR Required N**

**81330-1 DEFINITION.** A switching station is equipment in an electric distribution system where electric power is switched without transformation. Switching stations are located at points where it is necessary to branch off from a main feeder or feeders with smaller components due to physical location of the facilities to be served or to isolate portions of feeders for maintenance or repair. Switching Stations equipment may include circuit breakers, sectionalizing switches, structures, buses, grounding systems, security lighting, and protective devices. The primary unit of measure is kilovolt ampere (KV). It is obtained by multiplying the rated capacity of the switch in kilovolts times the rated capacity of the bus in amperes times the square root of three (1.732). The alternate unit of measure of total number of switches in and out of the switching station (EA) shall be entered on the property record card.

**81330-2 PROPERTY RECORD CARD USAGE.** All switching stations that are comprised of a group of functionally integrated assets, such as circuit breakers and associated outdoor buswork, which are typically surrounded by a fence and given its own facility number shall be shown on a separate property record card. All other sectionalizing switches shall be totaled separately by voltage class and by overhead and underground distribution systems, for each special area. A detailed list of individual switches totaled on the property record card should be kept in Maximo (SPM) or by another method (e.g. Excel or Access) and the file attached to the property record card.

## **813 40 LIGHTNING PROTECTION SYSTEM, STANDALONE (EA)**

**FAC 8134**

**BFR Required N**

**81340-1 DEFINITION.** Standalone Lightning Protection Systems are those that are not included as part of a specific facility's installed equipment. These are usually constructed to protect a compound, a single building (where the system is constructed of masts and is not a part of the facility) or series of buildings.

**81340-2 PROPERTY RECORD CARD USAGE.** Capture an entire "system" or "array" on an individual property record card. For example, an array consisting of 12



poles would be captured on an individual property record card, with a count of 12 each (EA). Note that FAC 8134 has an upper limit of four because the most common configuration consists of a wire net held up by four poles. Since systems can differ in number of poles and cables/nets/rods, any system or array consisting of more than four poles requires a size certification code of “C”, indicating that the size of allocation is greater than the FAC upper limit. Otherwise, the Facilities Sustainment Model (FSM) will automatically change the size of the allocation to the “Reset value”.

## **820 HEAT AND REFRIGERATION (A/C)**

### **820-1 HEAT AND REFRIGERATION**

The requirements for heat, hot water, and industrial steam at naval installations will be based on an engineering study of the overall station demand. A central heating facility will include a heating plan, fuel storage, distribution system, and controls. Planning information for heating facilities under the following basic category codes:

- Code 821 Heat, Steam—Source
- Code 822 Heat, Transmission and Distribution Lines
- Code 823 Heat, Gas—Source
- Code 824 Heat, Gas—Transmission
- Code 826 Refrigeration/Air Conditioning

## **821 HEAT SOURCE**

### **821-1 HEAT SOURCE**

The source of heat from steam or high temperature water (HTW) includes a complete central plant and associated fuel storage. The source of heat and steam/HTW are coded to indicate the type of fuel used by the plant. The Navy codes are as follows:

### **821 09 - 821 50 HEATING PLANTS**

**82109/82150-1 HEATING PLANTS.** A central heating plant will include a structure, piping, equipment, controls, fuel, storage, and all equipment necessary to make a complete usable facility. Central heating plants are justified only when the total owning and operating costs for central plants and distribution systems are less than similar costs for heating systems in individual buildings. Central heating plants are also justified when the overall energy use for providing heat from extraction steam in a steam-electric-power plant would be less than a central plant plus purchased electricity. The type of fuel for the plant, whether an electric power generating plant with by-product heat and steam, or a heating plant, will be selected on the basis of an economic

analysis. The heating plant capacity will be based on BTU per hour (BH) rating, and this rating will be determined from an engineering analysis of the need for steam, heat, and hot water at the station.

## **821 09 HEATING PLANT BUILDING (SF)**

**FAC 8910**

**BFR Required N**

**82109-1 DEFINITION.** This Category Code is used for buildings associated with a heating plant including Category Codes 821 12, 821 22, or 821 30.

**82109-2 PROPERTY RECORD CARD USAGE.** Each heating plant building should be listed on a single, individual property record card. The equipment internal to the power plant should not be listed in this Category code; it should be listed separately on a single separate property record card.

## **821 12 HEATING PLANT- OIL / GAS (BH)**

**FAC 8211**

**BFR Required N**

**82112-1 DEFINITION.** This Category Code is used for a plant that utilizes oil or gas for the production and distribution of heat. This includes steam, hot water, high pressure/low pressure, etc., serving more than one separate facility. This category code includes all necessary equipment for the production of the commodity including boilers, boiler feedwater, make-up water, controls, compressed air, condensate and blowdown, fuel tanks, pumps, electrical equipment, labs, storage and all required process equipment for commodity generation. The primary unit of measure is plant design capacity in BTU per hour (BH).

**82112-2 PROPERTY RECORD CARD USAGE.** All equipment for heating plant should be listed on a single, individual property record card. Plants typically contain water treatment facilities as part of the thermal plant and are not reported separately. However, where additional water treatment is required to meet NAVSEA clean steam requirements, the water treatment should be reported separately using Category Code 841 10.

## **821 22 HEATING PLANT- COAL (BH)**

**FAC 8211**

**BFR Required N**

**82122-1 DEFINITION.** This Category Code is used for a plant that utilizes coal for the production and distribution of heat. This includes steam, hot water, high pressure/low pressure, etc., serving more than one separate facility.

This category code includes all necessary equipment for the production of the commodity including boilers, boiler feedwater, make-up water, controls, compressed air, condensate and blowdown, fuel tanks, pumps, electrical equipment, labs, storage and all required process equipment for commodity generation. The primary unit of measure is plant design capacity in BTU per hour (BH).

**82122-2 PROPERTY RECORD CARD USAGE.** All equipment for heating plant should be listed on a single, individual property record card. Plants typically contain water treatment facilities as part of the thermal plant and are not reported separately. However, where additional water treatment is required to meet NAVSEA clean steam requirements, the water treatment should be reported separately using Category Code 841 10.

### **821 30 HEATING PLANT- NON - FOSSIL FUEL (BH)**

**FAC 8211**

**BFR Required N**

This CCN contains assets previously listed in Category Code 821 32 and 821 50.

**82130-1 DEFINITION.** This Category Code is used for a plant that utilizes a non-fossil fuel for the production and distribution of heat. This includes steam, hot water, high pressure/low pressure, etc., serving more than one separate facility. This category code includes all necessary equipment for the production of the commodity including boilers, boiler feedwater, make-up water, controls, compressed air, condensate and blowdown, fuel tanks, pumps, electrical equipment, labs, storage and all required process equipment for commodity generation. The primary unit of measure is plant design capacity in BTU per hour (BH).

**NOTE: Geothermal plants should also be listed under this category code.**

**82130-2 PROPERTY RECORD CARD USAGE.** All equipment for heating plant should be listed on a single, individual property record card. Plants typically contain water treatment facilities as part of the thermal plant and are not reported separately. However, where additional water treatment is required to meet NAVSEA clean steam requirements, the water treatment should be reported separately using Category Code 841 10.

### **821 60 - 821 61 HEATING FUEL OIL STORAGE**

**82160/82161-1 HEATING FUEL OIL STORAGE.** The following criteria pertain to both category codes 821-60 and 821-61. The planning factor is based upon the combined fuel oil consumption at the activity for heating.

**82160/82161-1.1 Amount of Storage.** The amount of storage varies with the number of personnel attached to the station and the activity. In temperate zones the normal average consumption is 70 gallons per person per month (including civilian employees). This figure would be revised in zones of extreme temperatures. Use this planning factor only if historical data is not available.

Department of Defense policy is that heating plants burning fuel oil must have a minimum of 30 day storage capability based on the coldest 30 day requirement. Installations that have direct access to and/or are supported directly by major military bulk fuel distribution systems should establish storage requirements based on detailed support agreement with the supply terminal command. Installations that do not have direct access to major fuel distribution systems should investigate logistic support factors (transportation modes; delivery times; precipitation, temperature and weather histories; etc.) to determine if it may be necessary to have storage capability exceeding the 30 day requirements. Activities utilizing fuels for dual purposes (i.e., diesel fuel for heating/transportation) should consider combined consumption when computing storage requirements. Installations should fill all storage tanks by late summer each year in order to reduce cold weather delivery problems, and tanks should be kept as full as possible at all times. This policy has been promulgated by OPNAV Instruction 4100.6 series. Additional justification is necessary for the fuel requirements associated with the generation of steam, operation of power plants, etc. The same 30-day storage requirement is also applicable.

**82160/82161-1.1 Types of Oil Stored for Each Category Code.** The category codes and corresponding types of oil stored by each facility are as follows:

- Category Code 821-60:
  - Grade No. 1. A light distillate oil intended for use in burners of the vaporizing type in which the oil is converted to a vapor by contact with a heated surface or by radiation. (Includes kerosene and JP-5 aviation turbine fuel).
  - Grade No. 2. A heavier distillate than grade no. 1. It is intended for use in atomizing-type burners which spray the oil into a combustion chamber where the tiny droplets burn while in suspension. The grade of oil is used in most domestic burners and in many medium-capacity commercial industrial burners where its ease of handling and ready availability sometimes justify its higher cost over the residual grade S. (Includes Diesel Marine Fuel (DMF), DF-2 and commercial diesel fuels).
  - Grade No. 3. Usually a light residual but sometimes a heavy distillate. It is intended for use in burners equipped with devices that atomize oils of higher viscosity than domestic burners can handle. Its permissible viscosity range allows it to be pumped and atomized at relatively low storage temperatures. Thus, except in extreme cold weather, it required no preheating for handling.

- Category Code 821-61:
  - Grade No. 4 (light). A residual fuel of intermediate viscosity for burners capable of handling fuel more viscous than grade no. 5 without preheating. Preheating may be necessary in some types of equipment for burning and in colder climates for handling. (Includes Navy Special Fuel Oil (NSFO)).
  - Grade No. 5 (heavy). A residual fuel more viscous than grade no. 6 (light). It is intended for similar service. Preheating may be necessary in some types of equipment for burning and in colder climates for handling.
  - Grade No. 6. A high-viscosity oil, sometimes referred to as "Bunker C", used mostly in commercial and industrial heating. It requires preheating in the storage tank to permit pumping and additional preheating at the burner to permit atomizing. The extra equipment and maintenance required to handle this fuel usually preclude its use in small installations.

**821 60      DISTILLATE HEATING FUEL OIL STORAGE (GA)**  
**FAC 1244**  
**BFR Required N**

**82160-1      DEFINITION.** This Category Code is used for fuel oil tanks used for heating buildings, generation of steam, power plant requirements, and for other heat generating facilities as required. No. 1 fuel oil, No. 2 fuel oil and No. 3 fuel oil are variously referred to as distillate fuel oils. Tanks listed under Category code 821 60 are not day tanks; they are bulk storage for the utility system. The primary unit of measure of gallons (GA).

**NOTE: Day tanks are included as part of the plant they serve rather than being reported separately.**

**82160-2      PROPERTY RECORD CARD USAGE.** Each storage tank should be listed on a separate property record card with other unit of measure of total storage capacity of the tank in gallons (GA).

**821 61      RESIDUAL HEATING FUEL OIL STORAGE (GA)**  
**FAC 1244**  
**BFR Required N**

**82161-1      DEFINITION.** This Category Code is used for fuel oil tanks used for heating buildings, generation of steam, power plant requirements, and for other heat generating facilities as required. No. 4 fuel oil, No. 5 fuel oil and No. 6 fuel oil are variously referred to as residual fuel oils. Tanks listed under Category code 821 61 are

not day tanks; they are bulk storage for the utility system. The primary unit of measure of gallons (GA) and the other unit of measure of storage capacity in gallons (GA) should be entered into iNFADS.

**NOTE: Day tanks are included as part of the plant they serve rather than being reported separately.**

**82160-2 PROPERTY RECORD CARD USAGE.** Each storage tank should be listed on a separate property record card with other unit of measure of total storage capacity of the tank in gallons (GA).

## **822 HEAT TRANSMISSION AND DISTRIBUTION LINES**

### **822-1 HEAT TRANSMISSION AND DISTRIBUTION LINES**

This basic category encompasses the transmission and distribution lines for steam and associated hot water lines throughout an installation. In temperate and tropical climates and at locations where the water table is high, steam lines will be aboveground. Routing of steam or hot water lines requiring underground installation under runways and taxiways should be held to a minimum to avoid interference by maintenance and repair operations. Adequate clearances shall be provided above roads, railroads, streets, walks, and tow-ways. Other restrictions such as flight clearances must be maintained. Steam and hot water transmission lines are coded as follows:

#### **822 09 STEAM / HEAT BUILDING / SHELTER (SF)**

**FAC 8910**

**BFR Required N**

**82209-1 DEFINITION.** Buildings associated with a heating distribution system (Category Codes 822 12, 822 14, 822 16 or 822 26). The requirement for steam and condensate or hot water pipelines is determined from an engineering study.

**82209-2 PROPERTY RECORD CARD USAGE.** Each building shall be listed on a single property record card. The equipment contained within the building shall be shown on a separate property record card.

#### **822 10 CONDENSATE RETURN PUMP STATION (EA)**

**FAC 8924**

**BFR Required N**

**82210-1 DEFINITION.** A condensate return pump station may serve steam, condensate, hot water, and high temperature water return line pump stations.

**82210-2 PROPERTY RECORD CARD USAGE.** All pump station equipment and condensate return lines are to be listed on a single property record card. Use the 'Facility Name' field to identify the facility as a steam, condensate, hot water or high temperature pump station. If the structure is aboveground, use 'CCN 89009 - Miscellaneous Utility Building' for the pump house building on a separate property record card. If the structure is underground, use 'CCN 89018 – Utility Vault' for the pump house structure (vault) on a separate property record card. Use the 'Facility Name' field to identify the building or structure to identify the facility as a steam, condensate, hot water or high temperature pump station building or structure (vault).

## **822 12 STEAM LINES (LF)**

**FAC 8221**

**BFR Required N**

**This category code contains assets previously listed under CCN 822 22.**

**82212-1 DEFINITION.** This Category Code contains all distribution system pipes that convey steam. The requirement for steam and condensate or hot water pipelines is determined from an engineering study.

**82212-2 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single steam distribution system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation. Each service area of the steam distribution system is considered a linear structure and shall have its own property record card.

## **822 14 CONDENSATE LINES (LF)**

**FAC 8221**

**BFR Required N**

**This category code contains assets previously listed under CCN 822 24.**

**82214-1 DEFINITION.** This Category Code contains all collection system pipes that convey condensate. The requirement for steam and condensate or hot water pipelines is determined from an engineering study.

**82214-2 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single condensate collection system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation. Each service area of the condensate collection system is considered a linear structure and shall have its own property record card.

**822 16      HOT WATER LINES (LF)****FAC 8221****BFR Required N**

**82216-1      DEFINITION.** This Category Code contains all pipes that convey hot water less than 250 degrees. The requirement for steam and condensate or hot water pipelines is determined from an engineering study.

**82216-2      PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single hot water system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation. Each service area of the hot water system is considered a linear structure and shall have its own property record card.

**NOTE: Use Category Code 822 14 for condensate lines.**

**822 26      HIGH TEMPERATURE HOT WATER LINES (LF)****FAC 8221****BFR Required N**

**82226-1      DEFINITION.** This Category Code contains all pipes that convey hot water heated above 250 degrees. The requirement for steam and condensate or hot water pipelines is determined from an engineering study.

**82226-2      PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single high temperature hot water distribution system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation. Each part of the high temperature hot water distribution system is considered a linear structure and shall have its own property record card.

**NOTE: Use Category Code 822 14 for condensate lines.**

**823            HEAT/GAS-SOURCE****823-1        HEAT/ GAS-SOURCE**

This basic category includes a central plant for generation of gas and related facilities including connected fuel storage for plant operation and storage of gas for direct heating or as a fuel for central plants. An engineering study is needed to determine the requirements for receipt, storage, distribution and vaporizing capacities of Liquefied Petroleum Gases (LPG). Gas generating and storage facilities are coded as follows:



**823 09 GAS GENERATING BUILDING (SF)**

FAC 8910

BFR Required N

**82309-1 DEFINITION.** This Category Code contains buildings associated with a gas generating plant.

**82309-2 PROPERTY RECORD CARD USAGE.** Each building shall be shown on a separate property record card. The primary unit of measure is square feet.

**823 10 GAS GENERATING PLANT (BH)**

FAC 8231

BFR Required N

**82310-1 DEFINITION.** This Category Code contains plant equipment that generates gas for use in the utility system.

**82310-2 PROPERTY RECORD CARD USAGE.** All equipment in the gas generating plant is included on a single property record card with a facility type code of 4. The buildings that house the gas generating plant equipment is shown on a separate property record card with a Category Code of 82309. The primary unit of measure for a gas generating plant is installed generating capacity in BTUs per hour (BH). The alternate unit of measure is installed generating capacity in cubic-feet per minute (CM).

**823 15 GAS METER BUILDING (SF)**

FAC 8910

BFR Required N

**82315-1 DEFINITION.** This Category Code contains buildings associated with gas metering.

**82315-2 PROPERTY RECORD CARD USAGE.** Each building shall be shown on a separate property record card. The primary unit of measure is square feet.

**823 20 GAS STORAGE TANKS (CF)**

FAC 8232

BFR Required N

**82320-1 DEFINITION.** This Category Code contains tanks for the storage of liquid natural gas and/or propane connected to a gas distribution system serving multiple facilities.

**82309-2 PROPERTY RECORD CARD USAGE.** Each tank shall be shown on a separate property record card. The primary unit of measure is each (EA) and the alternate unit of measure is the storage capacity of the tank in cubic feet (CF). Convert gallons to cubic feet by dividing gallons by 7.48.

## **824 HEAT/GAS TRANSMISSION**

### **824-1 HEAT/ GAS TRANSMISSION.**

This basic category applies to exterior lines, mains, and systems for transmission of gas for direct heating or as fuel for central plants.

#### **824 10 GAS MAINS (LF)**

**FAC 8241**

**BFR Required N**

**82410-1 DEFINITION.** The planning of gas pipelines includes trenching, piping, valve boxes, controls, and meters. The pipe capacity, strength, and linear footage requirements will be determined by an engineering study.

**82410 -2 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single gas distribution system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation. Each part of the gas distribution system is considered a linear structure and shall have its own property record card. The unit of measure is length of the pipe in linear feet (LF).

## **826 REFRIGERATION/AIR CONDITIONING**

**826-1 REFRIGERATION / AIR CONDITIONING.** This category code group is for chilled water and air conditioning plants Exclude cold storage facilities (see Category Code 430 series).

### **826 10 - 826 40 COOLING SYSTEM PLANTS**

**82610 THRU 82640-1 COOLING SYSTEM PLANTS.** A central refrigeration/air conditioning plant will include buildings with all equipment necessary to make a complete usable facility. If cooling towers are to be used for heat rejection, prevailing winds shall be considered when siting the facilities to avoid problems with moisture drift from the cooling towers; i.e., parking facilities should not be downwind from cooling towers. Vehicle access for equipment maintenance and replacement should be

considered. Central plants should be considered when a life cycle cost analysis demonstrate that the owning and operating cost of the plant will be less than that for individual building refrigeration equipment. For planning purposes, central refrigeration/air conditioning plant capacities can be determined by totaling the cooling requirements for all existing and for planned station buildings.

## **826 10 COOLING SYSTEM PLANT BUILDING (SF)**

**FAC 8910**

**BFR Required N**

**82610-1 DEFINITION.** Buildings associated with a cooling system plant (Category Code 826 20).

**82610-2 PROPERTY RECORD CARD USAGE.** Each building shall be listed on a single property record card. The equipment contained within the building shall be shown on a separate property record card with a category code of 82620.

## **826 20 COOLING SYSTEM PLANT (TR)**

**FAC 8261**

**BFR Required N**

This category code contains assets previously listed in CCN 826 25, 826 30, 826 40, and 890 42.

**82620-1 DEFINITION.** A plant for the production and distribution of a chilled fluid for more than one separate facility.

**82620-2 PROPERTY RECORD CARD USAGE.** This Category Code includes all the cooling system plant equipment; water systems, electrical systems, chilled water, make-up water, chiller, chiller feedwater, chemical feed, condenser, controls, compressed air, fuel systems, and cooling towers, on a single property record card. The building that houses the cooling system equipment is included on a separate property record card in CCN 826 10. The primary unit of measure is installed cooling system capacity in tons (TR).

## **827 CHILLED WATER-AIR CONDITIONING TRANSMISSION/DISTRIBUTION**

### **827-1 CHILLED WATER-AIR CONDITIONING TRANSMISSION / DISTRIBUTION.**

This basic category encompasses the transmission/distribution of chilled water from a central refrigeration/air conditioning plant to buildings throughout an installation for space air conditioning with water being returned to the plant. Routing of chilled water

lines under runways, taxiways, and buildings should be held to a minimum to avoid interference by maintenance and repair operations to the chilled water lines. If lines are located above ground, adequate clearances shall be provided above roads, railroads, walks and tow-ways. Other restrictions such as flight clearance must be considered. See NAVFAC Publication P-80.3. Underground lines have the advantage of reducing undesired heat gains and may not require insulation depending on ground temperatures.

## **827 10 COOLING SYSTEM VALVE BUILDING (SF)**

**FAC 8910**

**BFR Required N**

**82710-1 DEFINITION.** Buildings associated with a cooling distribution system (Category Code 827 20).

**82710-2 PROPERTY RECORD CARD USAGE.** Each building shall be listed on a single property record card. The equipment contained within the building shall be shown on a separate property record card.

## **827 20 CHILLED FLUID LINES (LF)**

**FAC 8271**

**BFR Required N**

This Category Code includes assets previously contained in CCN 827 25.

**82720-1 DEFINITION.** All distribution system pipes that convey chilled fluid.

**82720-2 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single chilled fluid distribution system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation. Each part of the chilled fluid distribution system that is considered a service area is a linear structure and shall have its own property record card. The unit of measure is length of piping in linear feet (LF).

## **830 SEWAGE AND WASTE**

### **830-1 DEFINITION**

Category group 830 describes the facilities required for the collection, transportation, treatment, and disposal of sewage and industrial waste, and disposal of storm drainage water in storm and sanitary sewer systems. Components of sewage and refuse facilities

include sewage treatment plants, outfall sewer lines, septic tanks, septic tank drain fields, sanitary sewers, sewage pumping stations, and incinerators. Certain industrial waste must be kept separately and treated separately from the sanitary sewage. In planning for sewage and waste facilities cognizance shall be taken of the Federal Water Pollution Control Act as amended, applicable to municipalities, industries, and others that may contribute to the pollution of surface and underground waters in the United States.

## **831 SEWAGE AND INDUSTRIAL WASTE, TREATMENT AND DISPOSAL**

### **831/83109/83110-1 DEFINITION**

The preferred method of sewage disposal is by discharge to a municipal or regional sewage system. Where this is not feasible, an on-station sanitary sewage treatment plant will be necessary to provide for the processing of sanitary sewage for ultimate disposal. Disposal of sewage is usually in a stream or other body of water or on land by subsurface irrigation or by direct absorption into the soil. A sewage treatment plant may include aeration tanks or trickling filters, settling basins, sump or storage wells, dry wells, pumps, screens, and accessories. The type and capacity of sewage treatment plant is determined by an engineering study that considers planned population, number of family quarters, and industrial peak loads.

### **831 09 SEWAGE TREATMENT BUILDING (SF)**

**FAC 8910**

**BFR Required N**

**83109-1 DEFINITION.** This Category Code includes the buildings associated with the sewage treatment plant (Category Code 831 10).

**83109-2 PROPERTY RECORD CARD USAGE.** Each building shall be included on a single property record card. The equipment contained within the building shall be shown a separate property record card.

### **831 10 SEWAGE TREATMENT PLANT (KG)**

**FAC 8311**

**BFR Required N**

**83110-1 DEFINITION.** This category code is used for all type of sewage treatment plants; primary, secondary, or tertiary. Please identify the level of treatment in Facility Use/ Description. All the plant equipment; equalization, preliminary treatment, clarification, holding tanks, biological treatment, chemical treatment, filtration, disinfection, dewatering, digestion, sludge disposal, electrical system, controls,

compressed air, storage, and communications, is included as a single wastewater treatment plant. The primary unit of measure is the installed plant processing capacity in thousands of gallons per day (KG). Do not use the permitted capacity for the units of measure.

**83110-2 PROPERTY RECORD CARD USAGE.** This category code includes all the sewage treatment plant process equipment on a single property record card. The buildings (not tanks) that house the sewage treatment equipment are shown on separate property record cards with Category Code 831 09.

## **831 11 - 831 16 SPECIALIZED TREATMENT FACILITIES**

**831 11 BALLAST CONTAMINATION SKIMMER (KG)**  
**FAC 8313**  
**BFR Required N**

No criteria are currently available for this Category Code.

**831 14 INDUSTRIAL WASTEWATER TREATMENT BUILDING (SF)**  
**FAC 8910**  
**BFR Required N**

**83114-1 DEFINITION.** This category code is used for buildings associated with an industrial wastewater treatment plant (Category Code 831 15).

**83114-2 PROPERTY RECORD CARD USAGE.** Each building shall be included on a separate property record card. The equipment contained within the building shall be shown on a separate property record card using Category Code 831 15.

**831 15 INDUSTRIAL WASTEWATER TREATMENT FACILITY (KG)**  
**FAC 8312**  
**BFR Required N**

**83115-1 DEFINITION.** This Category Code is used for a dedicated industrial wastewater treatment plant. All plant equipment; equalization, preliminary treatment, clarification, holding tanks, biological treatment, chemical treatment, filtration, disinfection, dewatering, digestion, sludge disposal, electrical system, controls, compressed air, storage, and communications, is included as a single wastewater treatment plant. The primary unit of measure is the installed processing capacity of the plant in thousands of gallons per day (KG). Do not use the permitted capacity as the unit of measure.

**83115-2 PROPERTY RECORD CARD USAGE.** This Category Code includes all the industrial wastewater treatment plant equipment on a single property record card. The buildings (not tanks) that house the industrial wastewater treatment equipment is included on separate property record cards with Category Code 831 14.

**831 16 OIL/WATER SEPARATOR (KG)**

**FAC 8313**

**BFR Required N**

**83116-1 DEFINITION.** This Category Code is used for oil/water separators that discharge to the sanitary sewer or industrial waste collection system. The primary unit of measure is the installed processing capacity of the equipment in thousands of gallons per day (KG).

**83116-2 PROPERTY RECORD CARD USAGE.** This category code is used for oil/water separators that discharge to the sanitary sewer or industrial waste collection system. Oil/water separators belong to the facility which it serves. If the oil/water separator discharges to storm sewer, it should be included under Category Code 871 11.

**831 20 OUTFALL SEWER LINE (KG)**

**FAC 8321**

**BFR Required N**

**83120-1 DEFINITION.** An outfall sanitary sewer line receives the sewage from a collecting system or the effluent from a sanitary sewage plant and carries it to a point of final discharge. Planning for outfall sewer lines will include land acquisition. The primary unit of measure is the capacity of the pipe in thousands of gallons per day (KG).

**83116-2 PROPERTY RECORD CARD USAGE.** A separate property record card for all the piping for each wastewater treatment plant shall be created.

**831 30 SEPTIC TANK AND DRAIN FIELD (GA)****FAC 8314****BFR Required N**

**83130-1 DEFINITION.** A septic tank and drain field facility provides sewage treatment for human waste at isolated facilities where an extension of the central sewer collection system would not be economically feasible. The planning of a septic tank and drain field will include a concrete or protected steel tank and a drain field system including headers, laterals, open joint clay or concrete pipe, gravel, ditching, and land acquisition. The primary unit of measure is tank capacity in gallons per day (GA).

**83130-2 PROPERTY RECORD CARD USAGE.** If these assets support a single facility, they are considered RPIE of the facility that they serve and a separate property record card should not be created. Where multiple facilities are served with a single tank and drain field a separate property record card shall be created.

**831 31 SEPTIC LAGOON AND / OR SETTLEMENT POND (GA)****FAC 8315****BFR Required N**

**83131-1 DEFINITION.** A structure used for collecting and holding sewage to allow for settlement and evaporation. These structures are typically concrete encased. If the lagoon or pond is part of a wastewater treatment or power generation plant, the structure is considered part of the plant and is not listed separately.

**83131-2 PROPERTY RECORD CARD USAGE.** A separate property record card shall be created for each lagoon or pond.

**831 39 RADIOACTIVE WASTE HANDLING BUILDING (SF)****FAC 8910****BFR Required N****831 40 RADIOACTIVE WASTE HANDLING FACILITY (EA)****FAC 8926****BFR Required N**

**83139/83140-1 DEFINITION.** No planning criteria for Category Codes 831 39 and 40 are currently available. Each facility requires individual justification.



## **831 41 HAZARDOUS WASTE STORAGE AND TRANSFER FACILITY (EA)**

**FAC 8926**

**BFR Required N**

**83141-1 DEFINITION.** Use this category code for facilities that are structures (non-buildings). For hazardous waste facilities that are buildings, use category code 83143 "Hazardous Waste Storage Building". The requirement for this facility is the result of the necessity to ensure that the transfer and storage of hazardous wastes will meet the Federal Criteria mandated by Title 40 of the Code of Federal Regulations (CFR), Parts 260 thru 266 as well as complying with OPNAVINST 6240,3 Series, which implements the requirements of the Resource Conservation and Recovery Act (PL 94-580) (42 USC 6901-6987), the Clean Water Act (PL 92-500), and the Navy Hazardous Materials Environmental Management Program by expanding controls on hazardous materials management in order to protect the environment. It is the intent of Congress and the Policy of the President (Executive Order 12088) that naval activities comply with these requirements to the same extent as any other entity or person.

Hazardous waste is any substance that cannot legally be disposed of in a normal sanitary landfill or into a refuse incinerator designated to handle municipal type refuse or cannot be discharged into a sanitary sewerage system. This facility is not intended to handle certain hazardous materials such as radioactive or ordnance wastes, for which other category codes have been designated. Any hazardous material can become a waste after having served its intended purpose, after exceeding its shelf life, by becoming contaminated, or by having been spilled. However, hazardous materials that have served a primary purpose and/or are excess to their primary user may have a secondary use. Such recyclable materials, though "excess" or "waste" to one organization, are not considered waste if their disposition is to a secondary user. By elimination, a hazardous waste is a non-reusable material that must be treated and/or disposed of in a specially designated facility that meets the regulatory requirements of the Resource Conservation and Recovery Act (RCRA) of 1976 (PL 94-580). It might be noted that sludge generated from treatment facilities may also be hazardous wastes.

**83141-3 FACILITY TYPES.** There are basically two types of facilities to handle hazardous waste 1) a short-term storage facility where materials are stored for periods of less than 90 days and 2) a long term storage facility where materials are stored for more than 90 days. The short-term facility does not require a permit to operate, but is required to meet all packaging and labeling requirements and to date the receipt of hazardous wastes. The requirements for short-term facilities are given in 40 CFR 262.34. The long term facility is subject to the requirements of 40 CFR, parts 264 and 265 and the permit requirements of 40 CFR, part 122.

**83141-4 DESIGN REQUIREMENTS.** The design requirements are found in UFC 3-201-01. It has been assumed that covered storage will be required to minimize the run-off from the facility and that the run-off will be packaged. In climate where runoff will not create a problem, open storage is acceptable and category code 831-41,

Hazardous Waste Storage Area, may be used. The modification of existing facilities is an acceptable alternative to the construction of new facilities.

**83141-5 SQUARE FOOTAGE REQUIREMENTS.** The square footage requirements for this facility are directly related to the Hazardous Waste Management Plan that must be filed by every identified activity handling this type of material in accordance with OPNAVINST 6240. This plan must indicate the type of hazardous waste collected, the rate of accumulation, and the frequency of movement from the activity in accordance with prescribed procedures. The selection of a short-term facility vs. a long-term facility is dependent upon the permits requested by the activity for the disposal of said waste.

**83141-6 PLANNING PREPARATION.** Prior to planning and establishing hazardous waste storage and transfer facilities, any actions must be cleared with the cognizant NAVFAC FEC which has the responsibility for area-wide coordination of the Navy Hazardous Materials Environmental Management program.

**83141-7 SITING.** A buffer zone of 150 meters (500 feet) shall be provided between the facility and the nearest inhabited area, stream, body of water, or critical mission areas such as ammunition, POL, or flammable stores.

**83141-8 SPACE ALLOCATIONS FOR OTHER FUNCTIONS.** Provide space for the following types of functions: laboratory, operation room office/lunchroom, enclosed loading dock and storage for the following kinds of waste: reactive, unknown, acid, general, organic, oxidizer and caustic.

## **831 42 HAZARDOUS WASTE STORAGE AREA (SY)**

**FAC 8526**

**BFR Required N**

**83142-1 DEFINITION.** The requirements for this facility are similar to those for category code 831 41 Hazardous Waste Storage and Transfer Facility. This type of storage facility is acceptable in climates where run-off will not create a problem. A buffer zone of 150 meters (500 feet) shall be provided between this facility and the nearest inhabited area, stream, body of water, or critical mission area such as ammunition, POL and inflammable stores.

However, this facility may be located in the proximity of the Hazardous Waste Storage and Transfer Facility when it is used to augment it.

**83142-2 SEGREGATION OF MATERIAL.** The danger involved in the storage of hazardous material are not measured solely by the quantity of material stored, but also by its sensitivity to reaction with one type of material with another.

**83142-3 PLANNING PROCEDURES:**

1. Determine the number and types of hazardous waste to be stored and their compatibility.
2. Determine rate of accumulation by past records.
3. Determine length of storage required (i.e. less than 90 days, etc.).
4. Item 1, 2 and 3 determine maximum number of drums to be stored at any given time. Note: Not all drums will be filled and sometimes more than one drum will be required for any given type of waste.
5. Criteria: Use 2.1 gross square yards per drum stored when each 55 gallon drum is stored in clusters of 4 per pallet or area.

*Example:* Given: 24 drums in six clusters, four per cluster.

*Solution:* A typical layout for this type of facility would be a concrete pad 23.0 ft. long and 19.5 ft. wide. An 8.0 ft. access aisle in the middle of the 19.5 ft. wide pad would provide room for the forklift truck to deposit and retrieve pallets, which are orientated at a 45 degree angle to the aisle. Each four foot square pallet would support four drums and the apex of each pallet would be three feet from the adjacent pallet. The centerline of the aisle would also serve as the high point of the slab so that any accidental spillage of the waste would not react with any of the surrounding material.

## **831 43 HAZARDOUS WASTE STORAGE BUILDING (SF)**

**FAC 4423**

**BFR Required Y**

**83143-1 DEFINITION.** Use this category code for facilities that are buildings used for hazardous waste storage (non-structures). For hazardous waste facilities that are structures, use category code 83141 "Hazardous Waste Storage and Transfer Facility". Use the information found under CCN 83141, sections 83141-1 through 83141-8 to develop space requirements.

## **832 SEWAGE AND INDUSTRIAL WASTE - COLLECTION**

### **832-1 DEFINITION**

This basic category includes collection systems and lines including pumping stations for sewage and industrial waste and collection of storm drainage. Planning for the sanitary sewer system will include piping, fittings, pumps, lift stations, and accessories. A sanitary sewer collection system will be required at all Naval installations and it will be based primarily on the population. The requirements will be determined by an engineering survey.

**832 10 SANITARY SEWER LINE (LF)**

FAC 8321

BFR Required N

**83210-1 DEFINITION.** All distribution system pipes that collect and transport sanitary sewage. Types include gravity or forced main systems. The primary unit of measure is linear feet of pipe (LF).

**83210-2 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single sanitary sewer collection system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation process. Each part of the sanitary sewer collection system is considered a linear structure and shall have its own property record card.

**832 20 COMBINED SEWER LINE (LF)**

FAC 8321

BFR Required N

**83220-1 DEFINITION.** All distribution pipes that collect and transport both sanitary sewage and storm water. The primary unit of measure is linear feet of pipe (LF).

**83220-2 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single combined sewer collection system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation process. Each part of the combined sewer collection system is considered a linear structure and shall have its own property record card.

**832 29 SEWAGE PUMP STATION BUILDING (SF)**

FAC 8910

BFR Required N

**83229-1 DEFINITION.** Buildings associated with a sewage pump station. The primary unit of measure is square feet (SF).

**83229-2 PROPERTY RECORD CARD USAGE.** Each pump station building shall be shown on a separate property record card. The equipment inside the pump station shall be shown on a separate property record card with a Category Code of 83230.

**832 30 SEWAGE WASTE PUMPING STATION (KG)**

FAC 8316

BFR Required N

**83230-1 DEFINITION.** A sewage pumping station is a facility used to move sewage through mains to a treatment plant, to serve where a gravity system is not feasible, and/or to lift sewage from one level to another in a gravity system. A sewage pumping station will include at least a sump or storage well and other pumping equipment, automatic controls, and hose equipment for cleaning the tanks. The primary unit of measure is pump station capacity “Thousand Gallons per Day” (KG). Use Category Code 832 30 for all sewage pump stations.

**83230-2 PROPERTY RECORD CARD USAGE.**

Any lift station associated with a single building, either inside the basement of the building or just outside the foundation of the building, should be considered RPIE to the building. Any lift station serving multiple facilities is considered part of an installation utility sewage or storm drainage system and shall be shown on a separate property record card. Include the building that houses the equipment for sewage pump stations on a separate property record card under Category Code 832 29.

**832 40 INDUSTRIAL WASTEWATER LINE (LF)**

**FAC 8321**

**BFR Required N**

**83240-1 DEFINITION.** This Category Code includes all distribution system pipes that collect and transport industrial wastewater. Types include gravity or forced main. The primary unit of measure is linear feet of piping (LF).

**83240-1 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single industrial wastewater collection system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation process. Each part of the industrial wastewater collection system that is considered a service area is considered a linear structure and shall have its own property record card.

**832 41 INDUSTRIAL WASTEWATER PUMP STATION (EA)**

**FAC 8316**

**BFR Required N**

**83241-1 DEFINITION.** Industrial wastewater pump stations are required to transport waste streams to holding tanks or industrial waste treatment plants, to serve where a gravity system is not feasible, and/or to lift waste streams from one level to another in a gravity system. The waste streams result from shore-based activities such as plating operations, painting and stripping operations, degreasing operations, firefighting schools and similar industrial processes.

Industrial process waste streams may contain both standard wastes and toxic pollutants. Typical pollutants found in industrial wastewater are oils, greases, heavy

metals, acids, alkalis, non-metallic materials (such as arsenic or selenium), phenols and halogenated phenols, paint stripping agents, solvents, surfactants, and degreasers. An industrial wastewater pumping station will include at least a sump or storage well and a structure to house pumping equipment, automatic controls, and hose facilities for cleaning the tanks. Where space is available, the lift station should include a ships ladder. The capacities and other requirements for industrial wastewater pump stations will be determined by an engineering survey.

**NOTE: Pump Stations supporting Oily Water/Waste Oil (OWWO) discharges and Ship's Overboard Discharge (SOD) operations from naval vessels should also be listed under CCN 83241.**

**83241-2 PROPERTY RECORD CARD USAGE.** All pump station equipment is listed on a single property record card. If the pump station supports OWWO operations, use the 'Facility Name' field to identify the facility as an OWWO Pump Station. For the building component which houses the pump station equipment, use 'CCN 89009 - Miscellaneous Utility Building' and modify the "Facility Name" field to identify the facility as an Industrial Wastewater or OWWO Pump Station Building.

## **833 SOLID WASTE MANAGEMENT**

### **833-1 DEFINITION OF SOLID WASTE**

The term "solid waste" used here is defined as non-hazardous solid waste. Certainly for the incinerator and landfill functions and possibly others listed below, the historical tonnage generation data is a necessity to determine accurate facility requirements. If the historical tonnage data cannot be determined, then estimates can be developed from:

- a) Population: estimates the tonnage generated based upon the population served.
- b) Land use factors: estimates tonnage based upon the type and quantity of facilities served.

These factors can be found in solid waste textbooks or from the EPA or other regulators.

**833 09 INCINERATOR BUILDING AND INCINERATOR (TN)**  
**FAC 8332**  
**BFR Required N**

**833 10 INCINERATOR - EXTERIOR (TN)**  
**FAC 8332**

**BFR Required N**

**83309/83310-1 DEFINITION.** An incinerator is a facility for burning combustible refuse to reduce it to stable gases and inert solids. An incinerator may be justified when the refuse of the Naval installation cannot be disposed of in a sanitary fill; when such method of disposal would create an unhealthy condition or nuisance and the land is not available for such purposes; when local municipal facilities or other Government facilities for disposal are not suitable or available at reasonable prices; or when contract prices for collection and disposal of refuse are economically excessive as opposed to collection and disposal by station personnel. Incinerator capacity will not exceed the capacities listed for applicable populations.

**Table 83309/83310-1. Incinerator Capacities**

Population (military-civilian residing on station)	Incinerator capacity (tons per 8 hr day)
up to 2,000	5
2,001 to 4,000	10
4,001 to 6,000	15
6,001 to 8,000	20
8,001 to 10,000	25

The capacities, as shown, include 25 percent excess over average hourly needs to allow for irregularity in delivery of refuse to the incinerator. The planner should consider the merits of the dump and charge method where the refuse may be stored for periodic regular burning with resultant economy of operation.

## **833 12 REFUSE/SOLID WASTE COLLECTION FACILITY – NON HAZARDOUS (SF)**

**FAC 8331**

**BFR Required N**

**83312-1 DEFINITION.** This facility serves as the collection center for non-hazardous solid waste awaiting disposal.

## **833 15 SANITARY/CUT-FILL DISPOSAL AREA (EA)**

**FAC 8333**

**BFR Required N**

**83315-1 DEFINITION.** Landfilling solid waste is the technology of last resort. Consult EPA and State regulations and the latest solid waste text books for engineering principles and practices in siting and scoping a landfill. Because of the large land

requirements associated with a landfill, determining the size of the landfill is the first priority.

### **833 20 GARBAGE GRINDER BUILDING (SF)**

**FAC 8330**

**BFR Required N**

**83320-1 DEFINITION.** A building used for the collection of refuse or recyclable materials before they are processed for disposal or recycling.

### **833 21 GARBAGE GRINDER (TN)**

**FAC 8331**

**BFR Required N**

### **833 30 GARBAGE STAND (EA)**

**FAC 8526**

**BFR Required N**

### **833 40 GARBAGE HOUSE/RECYCLE CENTER BUILDING (SF)**

**FAC 8910**

**BFR Required N**

**83320/83321/83330/83340-1 DEFINITIONS.** No planning criteria for Category Codes 833 20 through 833 40 are currently available. Each facility requires individual justification.

## **840 WATER FACILITIES**

### **840-1 DEFINITION.**

Water facilities at naval installations shall provide sufficient quantities of potable water for domestic and industrial use; purification of raw water from deep wells, lakes, and rivers; storage of water in bulk storage tanks or reservoirs; and distribution of water to demand areas. The location of the supply sources may be determined by topographic maps, soil maps, climate data, and geologic surveys. The selection of water sources must be consistent with economic considerations, such as gravity delivery if possible. Separate nonpotable water fire protective systems may be provided where applicable.

Planning information is provided for the following facility groups:



- Code 841 Potable Water - Supply, Treatment, and Storage
- Code 842 Water Distribution System - Potable
- Code 843 Water - Fire Protection
- Code 844 Water Supply/Storage – Nonpotable
- Code 845 Water Distribution System – Nonpotable

## **841 POTABLE WATER - SUPPLY, TREATMENT, AND STORAGE**

### **841-1 DEFINITION**

Planning for the treatment of water will include, as applicable, screening, settling, coagulation and sedimentation, filtration, disinfection, softening, and aeration. The water treatment systems are normally planned in millions of gallons (MG) per day capacity and distribution is in linear feet (LF). The systems must be adequate to meet the domestic and industrial requirements and to provide fire protection if a separate fire protection system is not provided. If separate nonpotable water protective systems are not provided, the capacity of the water supply system will be determined by the fire flow demand (see Code 843). Planning requirements for water treatment facilities will be based on the results of an engineering survey and an economic analysis to determine sources of water versus commercial or municipal supply. For water treatment methods see MIL HDBK-1005/7.

### **841 09 WATER TREATMENT FACILITY BUILDING (SF)**

**FAC 8910**

**BFR Required N**

**84109-1 DEFINITION.** This Category Code includes buildings associated with a Water Treatment Plant (841 10), Desalinization Plant (841 25), or Wells - Potable Water (841 50).

**84109-2 PROPERTY RECORD CARD USAGE.** Each building shall be included on a single property record card. The equipment contained within the building shall be shown a separate property record card.

### **841 10 WATER TREATMENT PLANT - POTABLE (KG)**

**FAC 8412**

**BFR Required N**

**84110-1 DEFINITION.** This Category Code includes the structures, equipment, and processes required to treat potable water.

**84110-2 PROPERTY RECORD CARD USAGE.** All the water treatment plant equipment; clear wells, preliminary treatment, coagulation flocculation, sedimentation, adsorption, filtration, chemical treatment and storage, disinfection, electrical, water and compressed air systems, controls, and communication, is included on a single property record card. The Unit of Measure is installed capacity in thousands of gallons per day (KG). Use CCN 841-09 in conjunction with CCN 841-10 to capture the both the treatment plant and the associated building on separate property record cards.

**841 15 NUCLEAR REACTOR WATER TREATMENT FACILITY (KG)**  
**FAC 8412**  
**BFR Required N**

**84115-1 DEFINITION.** No criteria for this facility are currently available.

**841 20 WATER SUPPLY LINE (LF)**  
**FAC 8421**  
**BFR Required N**

**84120-1 DEFINITION.** The pipe that conveys water from source to point of treatment or to the point of consumption. A pressure main will be needed if the water is pumped. However, if topography permits, a gravity system is planned. A twin conduit may be used to insure uninterrupted water supply. The unit of measure is linear feet of each pipe.

**84120-2 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single water supply system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation process. Each part of the water supply system that is considered a linear structure shall have its own property record card.

**841 25 DESALINIZATION PLANT (KG)**  
**FAC 8415**  
**BFR Required N**

**84125-1 DEFINITION.** A water treatment plant that utilizes a process, such as distillation, reverse osmosis, or electro dialysis, that removes dissolved mineral salts and other dissolved solids from water. The primary unit of measure is installed capacity of the plant in thousands of gallons per day (KG).

**84125-2 PROPERTY RECORD CARD USAGE.** All the equipment involved in the desalination process; clear wells, preliminary treatment, coagulation flocculation, sedimentation, adsorption, filtration, chemical treatment and storage, disinfection, electrical, water and compressed air systems, controls and communication, is included on a single property record card.

**841 30 STORAGE TANKS - ELEVATED, POTABLE (GA)**

**FAC 8413**

**BFR Required N**

**841 40 STORAGE TANKS - GROUND LEVEL, POTABLE (GA)**

**FAC 8413**

**BFR Required N**

**83130/84140-1 DEFINITION.** Water storage tanks for potable water are elevated or ground-level structures used to store bulk quantities of potable water. Elevated tanks for potable water provide both storage and static pressure for the distribution system. Ground-level tanks accommodate peak demand requirements without affecting the capability of the source. The planning for potable water storage tanks will be based on the requirements determined by an engineering survey. These surveys will determine the capacities and pressures required for the water system. Elevated tanks will not be planned in the immediate vicinity of an airfield. Water uses which must be considered in estimating potable water requirements for shore installations are (a) domestic, (b) industrial, and (c) fire protection.

**84130/84140 – 2 PROPERTY RECORD CARD USAGE.** Water storage tanks located at the water treatment facility that are part of the plant process are included with the water treatment facility (841 10) and are not classified as separate real property. Water storage tanks that are considered part of the distribution system shall be listed on individual property record cards. The unit of measure is rated storage capacity of the tank in gallons (GA).

**841 50 WATER WELLS - POTABLE (KG)**

**FAC 8414**

**BFR Required N**

**84150-1 DEFINITION.** Equipment that pumps water from underground sources to treatments plants or directly to distribution with minor treatment possibly injected. The building that houses the well equipment shall be listed on a separate property record card utilizing category code 841 09. The primary unit of measure is well capacity in thousands of gallons per day (KG) and the alternate unit of measure - installed capacity in gallons per minute (GM) shall both be included on the property record card.

**84150-2 PROPERTY RECORD CARD USAGE** - All equipment associated with a single well shall be shown on an individual property record card. Each well shall be shown on a separate property record card.

**841 51 RESERVOIR - POTABLE WATER (MG)**

**FAC 8443**

**BFR Required N**

**84151-1 DEFINITION.** An open body of water for the collection and storage of water used by a water treatment facility or water distribution system. The Unit of Measure is reservoir capacity in millions of gallons (MG)

**84151-2 PROPERTY RECORD CARD USAGE** – Each reservoir shall be shown on a separate property record card.

**841 52 WATER CATCHMENT STRUCTURE (GA)**

**FAC 8442**

**BFR Required N**

**84152-1 DEFINITION.** A man-made structure designed to capture or collect rainwater and used to produce potable water. The primary unit of measure is linear feet around the structure (LF).

**84151-2 PROPERTY RECORD CARD USAGE** – Each structure shall be shown on a separate property record card.

**842 WATER DISTRIBUTION SYSTEM, POTABLE**

**84209/84210-1 DEFINITION.** Potable water will be transmitted from a storage tank or a treatment plant to all station demand points through a pipeline. An engineering study of the pressures and quantities of water required at the demands points will serve as the basis for planning the sizes and lengths of pipe required for the water distribution pipelines. Planning for a potable water distribution pipeline will include requirements for piping, valves, pumps, connections, excavation, and backfilling. The pipeline shall be listed in linear feet (LF). Requirements will be determined by an engineering study.

**842 09 WATER DISTRIBUTION BUILDING, POTABLE (SF)**

**FAC 8910**

**BFR Required N**

**84209-1 DEFINITION.** This Category Code includes buildings associated with the distribution of potable water, typically housing distribution pumps and equipment.

**84209-2 PROPERTY RECORD CARD USAGE** – Each building shall be included on a single property record card. The equipment contained within the building shall be shown on a separate property record card using category code 842 15.

## **842 10 WATER DISTRIBUTION LINE, POTABLE (LF)**

**FAC 8421**

**BFR Required N**

**84210-2 DEFINITION.** All pipes that convey potable water from the treatment plant to the end user. The primary unit of measure is linear feet of pipe (LF).

**84210-2 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single water distribution system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation process. Each part of the water distribution system that is considered a linear structure shall have its own property record card.

## **842 15 PUMP STATION - POTABLE WATER (KG)**

**FAC 8422**

**BFR Required N**

**84215-1 DEFINITION.** This category code will include the pump(s) and appurtenant piping, valves, and other mechanical and electrical equipment for pumping water in the potable water system. The primary unit of measure is installed pumping capacity of the station in thousands of gallons per day (KG) and the alternate unit of measure is the installed pumping capacity of the station in gallons per minute (GM) .

**84215-2 PROPERTY RECORD CARD USAGE.** All equipment in a single pump station is contained on one property record card.

## **843 WATER, FIRE PROTECTION**

**843-1 DEFINITION.** Fire protection requirements often dominate the plans of a water supply system. When the supply of fresh water is not adequate, salt water may be used. Since fire flow demands are usually greater than either the domestic or industrial demands, the capacity of the system will generally be determined by the fire flow demands. Fire flows are expressed in gallons per minute and are separate from the other water requirements.

Normal fire flow demands are as follows:

**843-1.1 Dwellings.** The fire flow requirements for residential areas shall be as follows:

- Individual and duplex units--1 story--500 gallons per minute
- Individual and duplex units--2 stories--750 gallons per minute
- Multifamily (3 or more) units--1 story--750 gallons per minute
- Multifamily (3 or more) units--2 stories --1,000 gallons per minute

**843-1.2 Light and Ordinary Hazards.** In both light and ordinary hazard areas, the fire flow requirements for both hose streams and automatic sprinkler systems shall be as indicated in the table below.

**Table 843-1  
Fire Flow Requirements (Gallons Per Minute)**

Height and Area (Sq Ft)	Unsprinklered		Sprinklered				
	Hose Streams		Hose Streams		Sprinkler Demand	Total	
	Fire Resistive, N.C. (Masonry) Ordinary, and Heavy Timber	Frame, N.C. (All Metal)	Fire Resistive, N.C. (Masonry) Ordinary, and Heavy Timber	Frame, N.C. (All Metal)		Fire Resistive, N.C. (Masonry) Ordinary, and Heavy Timber	Frame, N.C. (All Metal)
1 Story							
0-10,000	750	1,250	250	250	500	750	750
10,000-20,000	1,000	1,750	250	250	750	1,000	1,000
20,000-80,000	1,250	2,500	250	500	1,000	1,250	1,500
Multistory							
0-10,000	1,000	2,000	250	500	500	750	1,000
10,000-20,000	1,250	2,500	250	500	750	750	1,250
20,000-80,000	1,750	3,000	300	750	1,000	1,500	1,750

Notes:

1. All one-story buildings above 20 feet in height shall be classified as multistory.
2. Flows for hose streams shall be provided at 20 psi residual pressure.
3. Sprinkler demand requirements shall be based on a residual pressure at grade to provide a minimum pressure of 15 psi at the highest sprinkler.
4. In unsprinklered one-story buildings, less than 1,000 square feet ground floor area, hose streams requirement of 500 gpm generally will be satisfactory.

**843-1.3 Special Areas.** If the source demands are for a combination system, then it must be of sufficient capacity to provide for the domestic, industrial, and fire flow requirements simultaneously. If the source of supply is unreliable, a storage system

may be justified. Normally the most practical facility is the ground-level reservoir. Water storage requirements for fire protection are as listed in the following table

**Table 843-2**  
**Water Storage Requirements For Fire Protection**

Fire Flow Demands (gallons per minute)	Storage Requirements (hours)	Storage Requirements (gallons)
up to 750	1-1 ½	66,500
up to 1,250	2	150,000
up to 1,750	2	210,000
up to 2,250	2-2 ½	338,000
up to 3,000	3	540,000
over 3,000	4	960,000

## **843 10 FIRE PROTECTION LINES (LF)**

### **FAC 8432**

#### **BFR Required N**

**84310-1 DEFINITION.** Fire protection pipelines are used exclusively in the transmission of water for fire protection, not domestic use. Planning for protection pipelines includes hydrants, valves, connections, pumps, piping, excavating, and backfill. The primary unit of measure is linear feet of pipe (LF).

**84310-2 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single water distribution system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation process. Each part of the water distribution system that is considered a linear structure shall have its own property record card.

## **843 20 FIRE PROTECTION PUMP STATION (KG)**

### **FAC 8434**

#### **BFR Required N**

**84320-1 DEFINITION.** A fire protection pumping station is a collection of pumps and supporting equipment used to increase the pressure in the fire protection system.

**84310-2 PROPERTY RECORD CARD USAGE.** All equipment in a single pump station is contained on one property record card. The building that houses the equipment shall be listed on a separate property record card using Category Code 843 50.

**843 30 WATER STORAGE TANK - FIRE PROTECTION WATER (MG)****FAC 8435****BFR Required N**

**84330-1 DEFINITION.** Tanks that provide fire protection water storage to accommodate peak demand requirements. The primary unit of measure is tank capacity in millions of gallons (MG) and the alternate unit of measure is tank capacity in gallons (GA).

**84330-2 PROPERTY RECORD CARD USAGE –** Each tank shall be shown on a separate property record card.

**843 35 RESERVOIRS - FIRE PROTECTION WATER (MG)****FAC 8433****BFR Required N**

**84335-1 DEFINITION.** This Category Code is for a reservoir that has a capacity greater than or equal to one million gallons and typically provides a sufficient quantity of water in reserve to insure an uninterrupted flow for fire protection. The primary unit of measure is reservoir capacity in millions of gallons (MG).

**84335-2 PROPERTY RECORD CARD USAGE –** Each reservoir shall be shown on a separate property record card.

**843 40 WELLS - FIRE PROTECTION WATER (GM)****FAC 8431****BFR Required N**

**84340-1 DEFINITION.** This Category Code is for equipment that pumps water from underground sources to the fire protection system. The primary unit of measure is well capacity in gallons per minute (GM). The building that houses the well equipment shall be shown on a separate property record card utilizing Category Code 843 50.

**84340-2 PROPERTY RECORD CARD USAGE –** Each well shall be shown on a separate property record card.



**843 50 FIRE PROTECTION BUILDING (SF)****FAC 8910****BFR Required N**

**84350-1 DEFINITION.** This Category Code includes buildings associated with the distribution of fire protection water, typically housing distribution pumps and equipment.

**84350-2 PROPERTY RECORD CARD USAGE.** Each building shall be included on a single property record card. The equipment contained within the building shall be shown a separate property record card using Category Code 843 20.

**844 WATER SUPPLY/STORAGE, NONPOTABLE WATER****844-1 DEFINITION**

The water from these facilities will be used primarily for industrial purposes or as an emergency supply should there be a failure of the principal source. When a requirement for nonpotable water source exists, firefighting water requirements usually will be combined with this group. Requirements for this facility group are similar to that for Category Group 841 and 843. The Category Group 844 contains the following individual codes:

**844 10 WATER DISTRIBUTION BUILDING, NONPOTABLE WATER (SF)****FAC 8910****BFR Required N**

This Category Code contains assets that were previously listed in CCN 845 10.

**84410-1 DEFINITION.** This Category Code includes all buildings associated with the supply or distribution of non-potable water, typically housing distribution pumps and equipment. All former property record cards with category code 845 10 should be listed using this category code number.

**84410-2 PROPERTY RECORD CARD USAGE.** Each building shall be included on a single property record card. The equipment contained within the building shall be shown a separate property record card using category code 844 30 or 844 20.

**844 20 WATER WELL (KG)****FAC 8414****BFR Required N**

**84420-1 DEFINITION.** This Category Code includes equipment that pumps water from underground sources to a dedicated water distribution system, either potable or non-potable. The primary unit of measure is well capacity in thousands of gallons per day (KG).

**84420-2 PROPERTY RECORD CARD USAGE.** Each well and associated equipment shall be included on a single property record card with a facility type code of 4. The building that houses that houses the equipment shall be shown on a separate property record card using category code 844 10.

**844 30 PUMP STATION - NONPOTABLE WATER (KG)****FAC 8452****BFR Required N**

This Category code contains assets that were previously shown in 845 30.

**84430-1 DEFINITION.** This Category Code includes the collection of pumps and supporting equipment used to supply water to the non-potable water system. The primary unit of measure is the installed pumping capacity of the station in thousands of gallons per day (KG).

**84430-2 PROPERTY RECORD CARD USAGE.** The equipment in a single pump station is contained on a single property record card. The building that houses the equipment shall be listed on a separate property record card using Category Code 844 10.

**844 40 STORAGE TANKS - NONPOTABLE WATER (GA)****FAC 8442****BFR Required N**

**84440-1 DEFINITION.** This Category Code includes tanks that provide non-potable water storage to accommodate peak demand requirements.

**84440-2 PROPERTY RECORD CARD USAGE.** Each tank shall be shown on a separate property record card.

**844 41      STORMWATER FILTRATION – PERMEABLE SURFACE (SY)**  
**FAC 8716**  
**BFR Required N**

**84441-1 DEFINITION.** A stormwater management structure where runoff passes through the pavement surface and subbase layers, infiltrating into the soils below, e.g., Permeable Pavers, Pervious Concrete, Porous Asphalt, Reinforced Turf, Reinforced Gravel.

**844 42      STORMWATER FILTRATION – SWALES (SY)**  
**FAC 8716**  
**BFR Required N**

**84442-1 DEFINITION.** A Stormwater management structure that provides routing and damming of stormwater to achieve needed water filtration and reduce stormwater discharge rates, e.g., Dry Swale, Wet Swale.

**844 50      RESERVOIRS - NONPOTABLE WATER (MG)**  
**FAC 8443**  
**BFR Required N**

**84450-1      DEFINITION.** This Category Code includes a reservoir that has a capacity greater than or equal to one million gallons and typically provides a sufficient quantity of water in reserve to insure an uninterrupted flow for non-potable water requirements. The primary unit of measure is reservoir capacity in millions of gallons (MG).

**84440-2      PROPERTY RECORD CARD USAGE.** Each reservoir shall be shown on a separate property record card.

**844 51      STORMWATER TREATMENT STRUCTURE (GM)**  
**FAC 8717**  
**BFR Required N**

**84451-1 DEFINITION.** A stormwater control structure that uses chambers, gradations, or other built-in feature(s) in combination with filter media to remove sediment and other pollutants from stormwater before entering the storm sewer system. This includes manufactured filter structures.

**845 WATER DISTRIBUTION SYSTEM - NONPOTABLE**

**845-1 DEFINITION.** Facilities in this group support non-potable water supply systems and are similar to those described under Category Group 842. This group contains the following individual codes:

**845 20 WATER DISTRIBUTION LINE, NONPOTABLE (LF)****FAC 8451****BFR Required N**

**84520-1 DEFINITION.** This Category Code includes all pipes that transmit water in a dedicated nonpotable water distribution system. The primary unit of measure is linear feet of pipe (LF).

**84520-2 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single non-potable water distribution system after the utilities Maximo team has divided the installation into service areas as part of the linear segmentation process has been completed. Each part of the non-potable water distribution system that is considered a linear structure shall have its own property record card.

**850 ROADS AND STREETS****851 10 ROADS (SY)****FAC 8511****BFR Required N****851 11 ROADS, UNSURFACED (SY)****FAC 8512****BFR Required N****851 15 LOAD/UNLOAD RAMP (SY)****FAC 8928****BFR Required N****851 20 VEHICULAR BRIDGES (SY)****FAC 8513****BFR Required N**

**85110/85111/85115/85120-1**      **DEFINITION.** Roads, streets, and bridges are generally planned to conform to the standards and practices of the American Association of State Highway Officials (AASHO), Bureau of Public Roads (BPR), and State and local governments.

Planning is derived from the general development map of the station. See TM 5-822-2 / AFM 88-7 CHAP 5 for design criteria.

## **851 21      VEHICULAR PARKING, UNSURFACED (SY)**

**FAC 8522**

**BFR Required Y**

**85121-1**      **DEFINITION.** An unpaved surface for parking and/or staging private and/or government owned vehicles and equipment. The surface is usually graveled. Use the criteria under CCN 85210 Parking Area to develop parking requirements.

## **851 22      VEHICLE STAGING AREA (SY)**

**FAC 8523**

**BFR Required Y**

**85122-1**      **DEFINITION.** This category code represents surfaced areas for the temporary holding of vehicles and equipment awaiting deployment. It is not intended to be used for vehicle parking identified under CCN 85210 or un-surfaced parking and storage designated under CCN 85235 or CCN 85240.

## **851 23      TRAFFIC CONTROL SIGNALS (EA)**

**FAC 8541**

**BFR Required N**

**85123-1**      **DEFINITION.** Traffic control signals are devices used for directing pedestrian, vehicular or rail traffic by means of power-operated controls. Costs include signal devices, necessary supports, and electric power cables.

**85123-2**      **PROPERTY RECORD CARD USAGE.** Each (EA) is defined as one "intersection" as the unit of measure regardless of how many individual traffic signals or supports are in place at an intersection, with the understanding that in some cases the individual signal count may be low and in other cases it may be high - it averages out. List all traffic control signals on one PRC per site.

**851 25 VEHICULAR TUNNELS (LF)****FAC 8514****BFR Required N**

**85125-1 DEFINITION.** Vehicular tunnels are used for slope stabilization and automobile access in areas where steep slopes limit development and require innovative access solutions. These tunnels serve vehicular and pedestrian traffic as well as housing utility runs. They are also often used to combat soil erosion and protect facilities and personnel.

**852 SIDEWALKS AND OTHER PAVEMENTS****852 10 PARKING AREA (SY)****FAC 8521****BFR Required Y**

**85210-1 ORGANIZATIONAL VEHICLE PARKING.** The paved and/or stabilized area within an organizational motor pool and parking lot, including space required for entrance and exit roads and aisles within the lot, will not exceed the following:

**85210-1.1 Navy and Marine Corps installations (except Marine Corps installations with FMF Ground Units assigned).** Forty square yards per unit for 75% of the equipment supported. The 40 square yards per unit takes into account the varied sizes and types of automotive, construction, and materials handling equipment to be parked.

**85210-1.2 Marine Corps installations with FMF Ground Units assigned.** Seventy-five square yards for each vehicle to be accommodated. The 75 SY will be reduced to 50 SY per vehicle if more than 50% of the vehicles to be accommodated have an overall length of 18 feet or less and a width of 6 1/2 feet or less (such as administrative-type vehicles).

**85210-2 NON-ORGANIZATIONAL VEHICLE PARKING.** Authorized parking spaces for non-organizational vehicles are listed in Table 852-10. The space allowance for each parking space is 35 square yards. This provides room for the parked vehicle and for normal interior lanes, entrances, and exits.

Parking spaces for a facility not listed in the table shall be based on a special study of traffic analysis taking into account eligible vehicles, multiple utilization, time and space intervals, available public transportation, group-car riding and government-furnished transportation. For example, no planning factor has been established for parking space required for shipboard personnel while in homeport. Therefore, a special study would be

required to determine parking space needed to support this requirement. Such a study would take into consideration the number of ships which would be in the homeport at any one time and a derivation there from of the number of shipboard personnel requiring parking space. Where there is no direct experience, valid projections of available data may be made. Parking space for a listed facility, whether existing or planned, may be increased when justified by a special study or traffic analysis.

**Table 85210-1  
Allowances for Non-Organizational Vehicle Parking**

Facility	Number of Parking Spaces
Administration, Headquarters, and Office Buildings	60% of assigned personnel
Bakeries	75% of employees
Bank and Credit Union, when not included in a Community Shopping	2% of customers served
Cafeteria, Civilian, when not included in a Community Shopping Center	15% of seating capacity
Central Food Preparation Facilities	38% of employees
Chapels	30% of seating capacity
Child Development Centers (Patron Parking)	10% of children served
Child Development Centers (Staff Parking)	80% of staff
Commissary Stores, Food Sales, when not included in a Community Shopping Center	Contact DeCA for parking requirements.
Community Shopping Center, including such elements as Main Exchange, Miscellaneous Shops, Restaurant, Commissary Stores, Food Sales, Bank, Theater, Post Office	4% of customers served
Dental Clinic Parking	3 spaces per treatment room
Dormitories (BEQ, Enlisted Unaccompanied Personnel Housing)	70% of design capacity
Enlisted Personnel Dining Facilities (Staff Parking)	38% of employees

Facility	Number of Parking Spaces
Enlisted Personnel Dining Facilities (Patron Parking)	8% of enlisted personnel served
Exchanges, Main, when not included in a Community Shopping Center	25% of customers served
Family Housing	2.5 spaces per living unit
Field House, combined with Football and Baseball Facilities	1% of military strength
Fire Stations	100% of largest shift
Guard Houses, Brigs, Military Police Stations	30% of guard and staff strength
Fitness Center	1 percent of military strength served
Laundries and Dry Cleaning Plants	38% of employees
Libraries (Central)	1 space for each 46 m <sup>2</sup> (500 ft <sup>2</sup> ) of gross floor area
Libraries (Branch)	8 spaces
Maintenance Shops	40% of employees
Medical Facilities (Staff Parking)	Use UFC 4-510-01
Medical Facilities (Outpatient / Visitor Parking)	Use UFC 4-510-01
Naval Criminal Investigation Service Field Offices, Resident Agencies and Resident Units	60% of assigned personnel
Officers' Quarters (BOQ, Officer Unaccompanied Personnel Housing)	100% of living suites
Reserve Training Center Parking	80% of reservists, largest drill period
Schools, Dependent, with Auditorium	2 spaces per classroom plus 15 percent of auditorium seats
Schools, Dependent, without Auditorium	2 spaces per classroom
Security Offices: Population served 100 to 2,000	5 spaces
Security Offices: Population served 2,001 to 4,000 population	10 spaces



Facility	Number of Parking Spaces
Security Offices: Population served 4,001 to 6,000 population	15 spaces
Security Offices: Population served 6,001 to 10,000 population	20 spaces
Security Offices: Population served 10,001 and over	To be based on a special study.
Service Clubs (Open Mess and Club Facility)	2% of military strength served
Swimming Pools	20 percent of the pool capacity
Temporary Lodging Facilities	90% of bedrooms
Theaters, when not included in a Community Shopping Center	25% of seating capacity
Training Buildings (Staff Parking)	70% of staff
Training Buildings (Student Parking)	60% of students
Warehouses	40% of employees

**85210-3 REFUELING VEHICLE PARKING.** A paved area to provide parking for partially or fully loaded refueling units is required where such units are employed to provide fuel for aircraft. This area is to be differentiated from line vehicle parking (Category Code 116 45) which may provide operational parking for some refueling units requiring immediate access to aircraft apron. To determine the area required, a planning factor of 400 square yards per vehicle (refueling semi-trailer with tractor) may be used as a guide. The following criteria shall be adhered to:

**85210-3.1 Separation Distances.** One hundred feet is the optimum separation between fueling vehicle parking areas and surrounding buildings. This separation should be applied in the planning of new areas. For existing areas this separation should be used wherever possible without requiring extensive relocation or ground improvement. In such cases the 100-foot distance may be modified on the basis of local conditions, taking into consideration the size, nature, and importance of nearby exposed buildings. However, this separation distance should not be reduced below 50 feet.

A separation of 25 feet of centers will be maintained between parked fueling vehicles in designated areas. Distance between rows will vary depending upon the type and the length of the individual vehicles and their turning characteristics. However, the distance between rows will not exceed 50 feet.

**85210-3.2 Vehicle Alignment.** Vehicles should be aligned in single rows and should be capable of being driven out of storage areas in a single turn.

NOTE: The above-mentioned requirements do not apply to spacing and/or placing fueling vehicles in structures designed for servicing equipment of this nature.

**852 15 BICYCLE SHELTER (SF)**

**FAC 7384**

**BFR Required Y**

A facility to protect bicycles from the elements.

**852 20 SIDEWALK (SY)**

**FAC 8524**

**BFR Required N**

**852 30 PEDESTRIAN BRIDGES (SY)**

**FAC 8525**

**BFR Required N**

**85220/85230-1 DEFINITION.** Planning of sidewalks and pedestrian bridges is derived from the general development map of the activity. See TM 5-822-2 / AFM 88-7 CHAP 5 for design criteria.

**852 35 OTHER PAVED AREAS NOT CODED IN THE 100 OR 400 SERIES (SY)**

**FAC 8526**

**BFR Required N**

**85235-1 OTHER PAVED AREAS NOT CODED IN THE 100 OR 400 SERIES.**

This code is for miscellaneous pavements not captured in other 100 or 400 series category codes.

**852 39 MISCELLANEOUS OPEN STORAGE OR LAYDOWN AREA – UNPAVED (SY)**

**FAC 8522  
BFR Required N**

**85239-1 DEFINITION.** This area is an unpaved laydown area for staging private and/or government-owned vehicles and equipment, but is not used as parking lots. The unpaved surface is typically gravel. See CCN 85121 for unpaved parking lots.

**852 40 MISCELLANEOUS OPEN STORAGE OR LAYDOWN AREA - PAVED (SY)**

**FAC 8526  
BFR Required N**

**85240-1 MISCELLANEOUS OPEN STORAGE OR LAYDOWN AREA - PAVED.** This code is for open storage areas other than those used for general supply operations (Category Code 451 10). It includes Public Works Open Storage facilities. See Table 85240-1 for allowances.

**Table 85240-1  
Allowances for Public Works Open Storage**

PW Shop Type	Square Yards
A, B, C	225
D	380
E	780
F	1,180

NOTE: For Public Works Open Storage supporting PW shops larger than type F, add 2 SY of open storage for each maintenance craftsman over 500.

**852 41 BUILDING/TRAILER PAD WITH UTILITY CONNECTIONS (SY)**

**FAC 8526  
BFR Required N**

**85241-1 BUILDING/TRAILER PAD WITH UTILITY CONNECTIONS.** Paved surface constructed to support a temporary facility or trailer. Utility connections are part of the trailer pad requirements and allow temporary facilities (often Class 3 property) to be easily installed.

## **853            PARKING BUILDINGS, MISCELLANEOUS**

### **853 10        PARKING BUILDING (SF)**

**FAC 8531**

**BFR Required Y**

**85310-1      DEFINITION.** A structure or building designed for parking private and/or government owned vehicles and equipment in individual parking spots/locations. The facility may be above ground or underground. The parking building should be justified by land restrictions and economic considerations. Allow 33 m<sup>2</sup>/ 40 SY for each passenger vehicle. See table 85210-1 for authorized spaces.

## **860            RAILROAD TRACKS**

### **860-1         RAILROAD TRACKS DESCRIPTION**

This category group covers all two-rail tracks including spurs, sidings, yards, turnouts, with accessories and appurtenances such as barricades. It includes trackage on ship repair facilities, marine railways and portal crane structures.

### **860 10        RAILROAD TRACKAGE (MI)**

**FAC 8601**

**BFR Required N**

**86010-1      RAILROAD TRACKAGE.** The planning of railroad trackage will be based on an economic analysis of the cost of truck haulage versus the cost of the proposed use of railroad facilities. Trackage is planned to connect the base with the common carrier and for holding and unloading freight cars as required. The amount of railroad trackage to be constructed by the government is determined by the proximity of the common carrier lines and the traffic volume.

### **860 20        EXPLOSIVE BARRICADE FOR SUSPECT TRUCKS AND RAILROAD CARS (EA)**

**FAC 1495**

**BFR Required N**

**86020-1      EXPLOSIVE BARRICADE FOR SUSPECT TRUCKS AND RAILROAD CARS.** A suspect cargo site is for placing trucks and railcars containing ammunition or explosives that are suspected of being in a hazardous condition. These sites may be used jointly for railcars, motor vehicles and cargo containers. This facility should have

effective barricades on three sides and sited in accordance with OP-5 Vol.1. Barricaded rail or truck spurs used for temporary holding of railcars and/or motor vehicles (non-suspect) may be captured under this function. This Category Code is for inventory purposes only, a BFR is not required.

**860 30 RAILROAD BRIDGE AND TRESTLE (MI)**  
**FAC 8611**  
**BFR Required N**

**860 40 CRANE TRACKAGE (MI)**  
**FAC 8601**  
**BFR Required N**

**86030/86040-1 RAILROAD BRIDGE AND TRESTLE AND CRANE TRACKAGE.** When planning track layouts, railroad trackage should be separated from portal crane trackage, because, apart from the similarity of the rails, portal crane trackage requirements are completely different from railroad trackage. Where separation is impossible, both cranes and rolling stock will utilize a common rail, and the other railroad trackage rail shall be placed inside the crane gauge.

**860 41 RAILROAD SCALEHOUSE (SF)**  
**FAC 8612**  
**BFR Required N**

**86041-1 RAILROAD SCALEHOUSE.** A railroad scale house is a facility designed to weigh rail cargo. Typically, tracks are laid to allow railcars to be pulled through the scale house.

**870 GROUND IMPROVEMENT STRUCTURES**

**870-1 DEFINITION.** This category group includes drainage and storm sewer systems, boundary fencing, gates, guard towers and shelters and other related facilities.

**871            GROUND, DRAINAGE****871 10        STORM SEWER (LF)****FAC 8711****BFR Required N**

**871/87110-1    DEFINITION.** Storm sewers are components of a storm drainage system that collects the surface runoff water and conveys it to outlet points. Storm sewers are required at installations or areas where open drainage ditches would create a hazard to the operation of vehicles and aircraft or would prove hazardous to pedestrians. Storm sewers shall not be combined with sanitary sewers.

**871 11        OIL/WATER SEPARATOR - RUNOFF WATER (KG)****FAC 8313****BFR Required N**

**87111-1        DEFINITION.** A facility for the separation of grease, oil, or grit from wastewater.

**871 15        STORM WATER PUMPING STATION (EA)****FAC 8452****BFR Required N**

**87111/87115-1    DEFINITION.** Requirements for Category Codes 871 11 and 15 must be individually justified. No criteria are available.

**871 16        STORMWATER RETENTION PONDS (MG)****FAC 8715****BFR Required N**

**87116-1        DEFINITION.** An impoundment for the temporary storage of water resulting from runoff and drainage.

**871 20        DRAINAGE DITCH (LF)****FAC 8711****BFR Required N**

**87120-1        DEFINITION.** Drainage ditches serve the same purpose as storm sewers. They are preferable to covered structures to minimize construction, to conserve

materials, and to facilitate maintenance. Ditches should be planned to provide adequate depth to contain all runoff water anticipated from snow, ice, thaws, frozen ground, and severe rainfalls. In the planning of the drainage system, consideration should be given to the location of ditches to minimize the creation of hazards to vehicles or personnel. See MIL HDBK-1005/3 for technical information.

## **871 25 DAM (LF)**

**FAC 8714**

**BFR Required N**

**87125-1 DEFINITION.** A dam is an artificial or natural barrier usually constructed across a stream channel to impound water. Timber, rock, concrete, earth, steel or a combination of these materials may be used to build the dam. Dams must have spillway systems to safely convey normal stream and flood flows over, around, or through the dam. Spillways are commonly constructed of non-erosive materials such as concrete. Dams should also have a drain or other water-withdrawal facility to control the water level and to lower water levels for normal maintenance and emergency purposes.

**87125-2 Dimensions and Capacity:** A dam is at least six feet in height, measured vertically from top of barrier to elevation of lower downstream toe, and has an impounding capacity greater than 50 acre-feet; or is at least 25 feet in height, and has an impounding capacity greater than 15 acre-feet.

**Toe of Dam:** The junction of the downstream face of a dam with the natural ground surface. This is also referred to as the downstream toe.

**87125-3** Requirements for a new dam must be individually justified by an engineering study. When planning for this category code, consult with NAVFAC Engineering Service Center, Code CIOFP4.

## **871 26 LEVEE AND/OR DIKE (LF)**

**FAC 8714**

**BFR Required N**

**87126-1 DEFINITION.** A levee is a type of dam that runs along the banks of a river or canal. Levees reinforce the banks and help prevent flooding. By confining the flow, levees can also increase the speed of the water. Levees can be natural or man-made. A natural levee is formed when sediment settles on the river bank, raising the level of the land around the river. To construct a man-made levee, workers pile dirt or concrete along the river banks, creating an embankment. This embankment is flat at the top, and slopes at an angle down to the water. For added strength, sandbags are sometimes placed over dirt embankments.

**871 30 IRRIGATION FACILITY (LF)**  
**FAC 8451**  
**BFR Required N**

**871 35 RETAINING WALL (LF)**  
**FAC 8712**  
**BFR Required N**

**871 45 DREDGED SPOIL HANDLING FACILITY (GM)**  
**FAC 8714**  
**BFR Required N**

**87130/87135/87145-1 DEFINITION.** Requirements for Category Codes 871 30 through 45 must be individually justified. No criteria are available.

## **872 GROUNDS FENCING, GATES AND GUARD TOWERS**

### **872-1 DEFINITION**

This basic category provides boundary security in the form of fencing, walls, gates, watch towers, guard walks, and guard shelters. The type and amount of security planned is a function of the security classification required, and the economical utilization of security guards.

### **872 10 STATION SECURITY AND PERIMETER FENCING AND WALLS (LF)**

**FAC 8721**  
**BFR Required N**

**87210-1 DEFINITION.** Security fencing and walls define the limits of security areas and facilitate the effective and economical use of security personnel. Fencing is planned on the basis of a study of the security classification requirements of the installation. The permanency of the installation, availability of materials, presence of natural aids to security, guard personnel, security hazards, and problems and degree of security required, must be considered in all fence construction. Security fencing is generally of the type known as chain link or cyclone, or under certain conditions it may be barbed wire. Fences should be 50 to 150 feet from buildings or critical supplies to be protected. There should be at least 20 feet between perimeter fences and structures, parking areas, or natural features outside the fenced area which could offer concealment or



assistance to unauthorized access to area protected. When this is not possible, perimeter fencing should be increased in height or otherwise designed to compensate for the proximity of aids to concealment or access. See Table 87210-1 for appropriate applications and characteristics of fences.

**87210-1.1 Standard Security Fencing.** The average standard security fence of the so-called man proof type is the 7-foot cyclone, chain link fence with 1-1/2 foot outriggers mounting 3 barbed wire strands at 45 degrees, increasing the overall height of the fence to 8 feet. See UFC 4-022-03, Security Fences and Gates, for additional design details.

**87210-1.2 Security Fencing for Storage of Security Risk Categories I and II.** The fence fabric, height, installation, clear zones, and number of gates for SRC I and II Ammunition and Explosive (A&E) storage facilities must meet DoDM 5100.76, latest revision requirements. Additional design details are promulgated in UFC 4-022-03, Security Fences and Gates.

**87210-1.3 Barbed Wire.** There are instances such as in isolated air stations, where three strand barbed wire cattle fence will suffice around the entire perimeter of the station, augmented by standard security fencing of critical areas, if such exist and can be adequately patrolled.

**87210-1.4 Walls.** Where walls, floors, and roofs serve as barriers, they should be constructed and arranged to provide uniform protection equivalent to that provided by chain link fencing as specified.

**Table 87210-1  
Applications and General Characteristics Of Fences**

Application	Location or Special Requirement	Suitable Type	Height	
			Feet	Inches
Restricted Area Security	Restricted Areas — as defined in OPNAVINST 5530.14E	Chain link security fence with three strands of barbed wire mounted on outriggers (facing out except for brigs).	Refer to OPNAVINST 5530.14E	
Magazines storing SRC I & II A&E	Restricted Areas — as defined in DoDM 5100.76	Fence fabric shall be chain link, i.e., galvanized, aluminized, or plastic-coated woven steel, 2-inch square mesh made from 9-gauge diameter wire, excluding coating that meets Federal Specification RR-F-191K.	Refer to DoDM 5100.76	
Non-metallic Security	Where restrictions of visibility into activity is desired.	Wooden Security fence	Refer to OPNAVINST 5530.14E	

Application	Location or Special Requirement	Suitable Type	Height	
			Feet	Inches
Fence Requirement	At radio direction-finder structures.	Wooden Security fence		
	Where chain link materials are not available.	Wooden Security fence		
Protection of sports facilities, users and spectators	Athletic courts.	Chain link.	10-12	--
	Swimming pools.	Chain link or decorative wood.	6	--
	Playgrounds.	Chain link or decorative wood.	5	--
Snow fencing	Where drifting snow is a problem.	Picket interwoven with wire-studded metal posts	4	--
Right-of-way fencing	Railways, highways	Woven wire fencing or wooden or metal posts with or without barbed wire.	4.5	--
Animal Fencing	<i>Woven wire fencing with wooden or metal posts—barbed wire as indicated:</i>			
	Horses, mules, cattle, general.	1 strand top	--	47
	Hogs.	1 strand at bottom	--	32-39
	Sheep and goats.	1 strand at top	--	39-47
	Poultry.	None	--	48-72
Perimeter marking	Property lines, firing ranges, outside security barrier of high security area	Two strand barbed wire.	--	42
		Three strand barbed wire (wood or metal posts).	--	48
Decorative wood fencing	To discourage passage or access.	Picket fence.	3-5	--
		Post and rail or horizontal board.	4	--
	To provide privacy and screening.	Stockade fence.	6-8	--
		Louver fence.	6-7	--
		Basket weave fence.	6-8	--

Refer to OPNAVINST 5530.14E “Navy Physical Security and Law Enforcement Program” for definitions of critical areas.

**872 11 HARDENED SECURITY FENCE (SF)**  
**FAC 8722**  
**BFR Required N**

**87211-1 DEFINITION.** Security is a key issue for all military installations; hardened security fencing is used very effectively but will not stop a determined intruder. To be effective, such barriers must be augmented by security force personnel and other means of protection, detection, delay, and assessment. Security fences are used primarily to:

- a) Define the perimeter of a restricted area.

- b) Provide a physical and psychological deterrent to entry while serving notice that entry is not freely permitted.
- c) Prevent accidental entry.
- d) Optimize security force operations.
- e) Enhance detection and apprehension of intruders.
- f) Channel and control the flow of personnel and vehicles through designated portals.

**87211-2** Prior to making decisions to employ security fencing, perform a thorough risk and threat analysis to determine the degree of physical security required. As indicated in Chapter 2 of Chief of Naval Operations Instruction (OPNAVINST) 5530.14E "Navy Physical Security and Law Enforcement Program", extensive and costly security measures may be justified in certain cases to protect certain assets of security interest; however, ultimately the commanding officer of an activity is responsible for complying with established security requirements while at the same time working to achieve economy. To achieve this objective, higher echelon security requirements must be clearly understood. Additionally, evaluate the relative criticality and vulnerability of the security interest in relation to a ranking of potential threats, and calculate the specific level of security to ensure the best possible protection for that threat level in a cost-effective manner. Only after the above preliminary factors are addressed can a proper design be initiated. See MIL-HDBK-1013/1A, "Design Guidelines for Physical Security of Facilities", for guidance and more detailed procedures which may be helpful in the decision process.

**872 15 INTERIOR FENCING (NOT CODED IN 872 10) (LF)**  
**FAC 8721**  
**BFR Required N**

This Category Code is for inventory purposes only, a BFR is not required.

**872 20 GUARD AND WATCH TOWERS (EA)**  
**FAC 1499**  
**BFR Required N**

**87220-1 DEFINITION.** Where authorized, guard or watchtowers should be constructed at locations that will provide the best observation of security areas. The general building of guard towers at other than correctional facilities and certain special weapons projects is not presently considered appropriate. Each local security situation should be solved on its own merits.

**872 30 MECHANICAL SECURITY BARRICADE (EA)**  
**FAC 1458**  
**BFR Required N**

**87230-1 DEFINITION.** Mechanically operated barricade consisting of pop-up bollards, rising road plates, or wedges designed to control vehicle or other traffic. Drop arm barriers found at gates or rail road crossings and floating barrier systems around ships do not meet the definition of a mechanical security barricade and are not included. Costs include barrier installation, remote controls, safety loops, traffic arm, and traffic lights. CCTV, cameras, and alarms are considered equipment and are not included.

**87230-2 PROPERTY RECORD CARD USAGE.** EA is defined as a single barricade blocking a lane of traffic. A lane may have two barricades, one inside the gate entrance and one outside the gate entrance, therefore the count for that lane would be 2 (EA).

## **872 50 ENTRY GATE (LF)**

**FAC 8721**

**BFR Required N**

**87250-1 ENTRY GATE.** An entry gate is the frame, gate, or other apparatus that allows or restricts vehicle and animal entrance on access roads and pedestrian access through the perimeter fences or walls of an installation.

## **880 FIRE AND OTHER ALARM SYSTEMS**

### **880-1 FIRE AND OTHER ALARM SYSTEMS**

This basic category includes separate integral signal systems such as fire alarm, watch reporting, and security. Telephone reporting systems are planned with telephone systems (see Code 130).

### **880 10 FIRE ALARM SYSTEM (MI)**

**FAC 1351**

**BFR Required N**

**88010-1 FIRE ALARM SYSTEM.** Fire alarm systems are of two general types: exterior systems and interior systems. Exterior systems normally have alarm initiating devices outside buildings, but may have components within buildings. Interior systems service a single building or group of buildings and may be connected to an exterior system.

**88010-1.1 Exterior Fire Reporting Facilities.** Exterior fire reporting systems of either telegraphic radio or supervised telephonic types are authorized for installation in

built-up areas at military installations. The type of system selected for use shall be established on the basis of dependability, initial cost, and ability to maintain the system in operating condition. Extension of fire reporting systems will require consideration of compatibility with existing equipment. Fire reporting facilities will not normally be provided at isolated small areas, ammunition and ordnance storage, and similar restricted areas where personnel are not generally present to detect fires.

### **88010-1.2 Interior Fire Reporting Facilities**

**88010-1.2.1 Automatic Fire Alarm Systems.** Automatic fire detection and alarm systems are authorized for installation in:

1. Buildings, for protection of life, or in isolated and/or important facilities where automatic sprinkler protection would normally be provided but is not economically or technically feasible.
2. Combustible buildings used for the confinement of military prisoners where automatic sprinklers, normally provided, cannot be made available.
3. Combustible buildings of hospital groups and specific areas of noncombustible buildings of hospital groups, where automatic sprinklers are not provided.
4. One and two-story combustible dormitory-type living quarters, including bachelor officers' quarters, guesthouses, nurses' quarters, civilian dormitories, and similar buildings used for sleeping purposes.

**88010-1.2.2 Manual Fire Alarm Systems.** Manual fire and evacuation alarms are authorized for installation in:

1. Barracks, dormitories, bachelor officers' quarters and similar sleeping quarters involving 20 or more persons not otherwise provided with automatic fire detection alarms.
2. Combustible buildings used for confinement of military prisoners, not otherwise provided with automatic sprinkler or automatic fire detection systems.
3. Buildings involving personnel occupancy such as administration, clubs, schools, classrooms, hospitals, laboratories, industrial and similar structures. Normally, such buildings having occupancy of 20 or more persons will be provided with this type of alarm system.

## **880 20 WATCH REPORTING SYSTEM (MI)**

**FAC 1351**

**BFR Required N**

**88020-1 WATCH REPORTING SYSTEM.** A watch reporting system provides a method for the automatic and non-automatic detection of fire and for security protection (Intrusion Detection System) throughout designated areas, buildings, and structures. The watch reporting system provides local alarms and central station alarms to building

occupants and to station security and firefighting personnel. Watch reporting systems are planned on the basis of engineering surveys to determine the degree of fire protection and security required.

### **880 30 BASE ALERT SYSTEMS (MI)**

**FAC 1351**

**BFR Required N**

**88030-1 BASE ALERT SYSTEMS.** Base alert systems shall be planned for all Navy installations. The system may alert base personnel to air raids, chemical/biological attacks or any other type of terrorist attack. Horns of high-power type may be used as signal devices. Their locations shall be coordinated with structures and buildings to spread audible signals evenly and with enough intensity to be heard over a whole area or activity.

### **880 40 AIR CRASH/ALERT (MI)**

**FAC 1351**

**BFR Required N**

**88040-1 AIR CRASH/ALERT.** No planning criteria are currently available.

## **890 MISCELLANEOUS UTILITIES**

### **890 09 MISCELLANEOUS UTILITY BUILDING (SF)**

**FAC 8910**

**BFR Required N**

**89009-1 DEFINITION.** This Category Code is used for structures associated with public works utilities shops and other miscellaneous utility buildings. If a utility building cannot be classified under one of the other utility type buildings, this Category Code should be used. Specific the general use of the building in the facility name field.

### **890 10 ACETYLENE PLANT (EA)**

**FAC 8921**

**BFR Required N**

### **890 11 ACETYLENE DISTRIBUTION SYSTEM (LF)**

**FAC 8930**

**BFR Required N**

**89010/89011-1 DEFINITION.** Generally, the generation of acetylene is a function of private industry. Where commercial sources are nonexistent or of poor quality, a generating plant may be built. The quantity of acetylene required and the siting of an acetylene plant within safety criteria are determined by an engineering study. A typical acetylene generator building has an approximate gross area of 2,200 square feet.

## **890 15 NITROGEN PLANT (EA)**

**FAC 8921**

**BFR Required N**

**89015-1 DEFINITION.** A nitrogen plant is required for the provision of large quantities of nitrogen for special applications. Nitrogen is used where an inert gas is required. It prevents oxidation in welding and soldering. It prevents spoilage of perishable supplies by displacing air in special storage facilities. Nitrogen is also used in the quick freezing of food. Nitrogen is provided by commercial sources where available. A requirement for a nitrogen plant shall be determined by a special study. Nitrogen and oxygen are by-products of each other so preliminary guidance may be taken from oxygen plant criteria (Category Code 141 87 Liquid Oxygen Facility and 890 30 Industrial Oxygen Plant).

## **890 18 UTILITY VAULT-NON COMMUNICATIONS (EA)**

**FAC 8927**

**BFR Required N**

**89018-1 DEFINITION.** A utility vault is an enclosed structure generally made of concrete that contains utility equipment, connections and/or lines (non-communications). A utility vault is typically an underground structure. For communications maintenance vaults, use category code 131 12. This category code is for inventory purposes only.

## **890 20 COMPRESSED AIR PLANT (EA)**

**FAC 8921**

**BFR Required N**

## **890 21 COMPRESSED AIR DISTRIBUTION SYSTEM (LF)**

**FAC 8930**

**BFR Required N**

**89020/89021-1 DEFINITION.** Compressed air is used by the Navy in numerous applications, such as for pneumatic tools, laundry equipment, instrumentation and control equipment, and in hospitals and laboratories. If the requirement is sufficiently

large at an installation, a central compressed air plant and distribution system should be installed. A careful analysis of all compressed air operating requirements is necessary to determine the capacity and pressure of the distribution system. Usually, compressed air is distributed at 100 to 125 psig from a central system for general purpose needs. Special, high-pressure systems are required for ordnance plants, ammunition depots, catapults, and submarine facilities.

**89020/89021-1 PROPERTY RECORD CARD USAGE.** There may be multiple property record cards for a single compressed air distribution system after the linear segmentation process has been completed. Each part of the compressed air distribution system that is considered a linear structure shall have its own property record card. There will be multiple linear segments within a linear structure and they will be recorded in GIS. They do not need to be shown on the property record card. All property record cards for a single network are related by a RPNUID.

**890 25 CARBON DIOXIDE PLANT (EA)**  
**FAC 8921**  
**BFR Required N**

**89025-1 DEFINITION.** A carbon dioxide plant at a naval activity provides space for the storage and transfer of carbon dioxide. The space contains a storage tank and a distribution system used for refilling carbon dioxide fire extinguishers. The space required will approximate 1,200 to 2,000 square feet.

**890 27 ICE-MAKING PLANT (TN)**  
**FAC 7322**  
**BFR Required N**

**89027-1 DEFINITION.** No planning criteria are currently available.

**890 30 INDUSTRIAL OXYGEN PLANT (EA)**  
**FAC 8921**  
**BFR Required N**

**890 31 OXYGEN DISTRIBUTION SYSTEM (LF)**  
**FAC 8930**  
**BFR Required N**

**89030/89031-1 DEFINITION.** Industrial oxygen is obtained from private industry where feasible. Where oxygen must be produced, it is obtained by breakdown of air into oxygen and nitrogen. Nitrogen is a by-product. Breathing oxygen is handled separately



from industrial oxygen because of more stringent purity requirements. See Category Code 141 87 Liquid Oxygen Facilities for breathing oxygen.

### **890 45 VALVE HOUSE OR OTHER ENCLOSURE (SF)**

**FAC 8910**

**BFR Required N**

**89045-1 DEFINITION.** This Category Code is used for any structure used for housing valves or other utility equipment that is not contained in any other CCN.

### **890 46 UTILITY TUNNEL–NON COMMUNICATIONS (LF)**

**FAC 8931**

**BFR Required N**

**89046-1 DEFINITION.** This category code is for an underground tunnel in which utility systems (non-communications) are routed. There may be multiple utility systems in a single tunnel network. Utility tunnels are of a large enough cross section to allow walk-through access. For communications maintenance tunnels, use category code 131 13.

### **890 50 ICS COMMUNICATION LINES (MI)**

**FAC 1351**

**BFR Required N**

**Revised August 2015**

**89050-1 DEFINITION.** This category code is used for Industrial Control System (ICS) communication lines. By definition, wireless ICS communications are not addressed or inventoried in iNFADS.

**89050-2 PROPERTY RECORD CARD USAGE.** Industrial Control System communication lines shall be listed on a single property record card. Large installations with multiple geographic service areas will require a property record card for each geographic service area containing ICS communication lines.

### **890 51 ICS MONITORING STATION (SF)**

**FAC 8910**

**BFR Required: Y**

**Created August 2015**

**89051-1 BACKGROUND.** The Navy and Marine Corps Smart Grid Program aggregates building energy information, utility information, and operational technologies

(i.e. Industrial Control System (ICS)) in order to reduce facility maintenance costs, reduce energy consumption, and support mission assurance. Centralization of an ICS requires the establishment of regional and installation level ICS Monitoring Stations where various building and utility systems can be monitored and controlled.

**89051-2 DEFINITION.** The ICS Monitoring Station is the utility support facility that houses the operational components of the ICS as well as the personnel that operate the system. The ICS Monitoring Station is a component of the ICS and makes the ICS complete and usable. An ICS Monitoring Station should not be confused with a National Operations Center (NOC), Regional Operations Center (ROC) or Emergency Operations Center (EOC).

### **89051-2.1 Types of ICS Monitoring Stations.**


Although a variety of ICS Monitoring Station types exist, they all encompass processes that enable the intelligent monitoring, forecasting, response to and control of Navy and Marine Corps building and utility systems. ICS Monitoring Stations are organized around a central master control space, ranging from a large room with multiple workstations to a single computer workstation. For this UFC, it is assumed that an ICS Monitoring Station will be one of two basic types:

- Consolidated: Integrates all required systems and components into one facility
- Distributed: Locates required spaces and components throughout two or more facilities or locations







Many variations are possible within these two basic types. Consult FC 4-141-05N for design criteria.

Table 89051-1 below is provided for reference purposes and itemizes the various components of an Industrial Control System, of which the ICS Monitoring Station is just one component.

**Table 89051-1: Components of an Industrial Control System**

<b>ICS Components Located <u>OUTSIDE</u> of a Controlled Building or Utility</b>		
<b>Component</b>	<b>Picture</b>	<b>Property Classification</b>
ICS Monitoring Station (Building – Square Feet)		Real Property (CCN 89051)
Wired Communications (Cable – Linear Feet)		Real Property (CCN 89050)
Network Devices		Personal Property
Computers		Personal Property
Software		Personal Property
Wireless Communications		Personal Property

**Table 89051-2: Components of an Industrial Control System**

<b>ICS Components Located <u>INSIDE</u> of a Controlled Building or Utility</b>		
<b>Component</b>	<b>Picture</b>	<b>Property Classification</b>
Supervisory Controllers		Real Property Installed Equipment
Network Devices		Personal Property
Supervisory Control and Data Acquisition (SCADA)		Real Property Installed Equipment
Direct Digital Control (DDC)		Real Property Installed Equipment
Advanced Metering Infrastructure (AMI) Meters		Real Property Installed Equipment
Sensors		Real Property Installed Equipment
Actuators		Real Property Installed Equipment
Cameras		Personal Property
Protection		Personal Property

**89051-3 SPACE TYPES AND PLANNING FACTORS****89051-3.1. Office and General Purpose Spaces.**

**89051-3.1.1. Private Offices.** Allocate 120 NSF/PN per Private Office required.

**89051-3.1.2. Open Offices.** Allocate 64 NSF/PN per Open Office required.

**89051-3.1.3. Administrative Support Space.** This space supports the administrative functions and includes all such functions not included in personal office space. It includes space for working office storage, copiers, working files, printers, scanners, shredders, safes, and facsimile machines. Allocate 8 NSF/PN for all personnel in office spaces.

**89051-3.1.4. Conference Room.** For a Regional ICS Monitoring Station with up to 24 total personnel, provide one conference room at 400 NSF. For an Installation Level ICS Monitoring Station conference room (if required), allocate 200 NSF.

**89051-3.1.5. Reception Area.** A Reception Area is used for receiving visitors and controlling access to ICS Monitoring Station spaces and are justified only for large, consolidated ICS Monitoring Stations. Allocate 64 NSF for a reception desk and include space for up to 5 visitors @ 20 NSF/visitor.

**89051-3.1.6. Circulation.** This is space used to provide for circulation in and around the administrative space types above. Apply an Office and Assembly Space Circulation multiplier of 10% to the NSF allocation.

**89051-3.2. Special Purpose Spaces**

**89051-3.2.1. ICS Integration and Application Space.** ICS Integration and Application Space is used for training and work bench space, but it is not continuously manned. Allocate 200 NSF for ICS Integration and Application Space.

**89051-3.2.2. IT Storage Space.** IT Storage Space is used for storage of IT equipment and supplies. Allocate 150 NSF for IT Storage Space.

**89051-3.2.3. Master Control Room.** A Master Control Room (MCR) is the central monitoring and action function within the ICS Monitoring

Station. Sizing of the MCR is based on the number of operators and associated work stations. It includes a minimum of two operator work stations and may include a large, centralized, flat panel display area with a minimum of 24" deep enclosed computer space on video walls. The MCR is rectangular in shape; depth is based on operator visual range, and width is based on the number of operators and necessary display information. Allocate 90 NSF/operator station.

**89051-3.2.4. Server Room.** A Server Room contains computer equipment mounted in racks. The average rack size is assumed to 24"W x 40"D x 81"H. An evaluation shall be done to determine the total number of racks required. Once the required number of racks has been determined, use "Table 131-6, Equipment Room Requirement by Total Racks" (in the 100 series document) to determine NSF requirement:

**89051-3.2.5. Technical Equipment Area.** A Technical Equipment Area is required for charging, check-out network update, and maintenance of laptop, ELMRS radios, etc. Allocate 100 NSF for a Technical Equipment Area.

**89051-3.2.6. Bunk Room.** A Bunk Room may be justified due to base emergency event protocols for self-sufficiency as determined by the base commanding officer. For a Consolidated ICS Monitoring Station, allocate 130 NSF for Bunk Room.

**89051-3.2.7. Break Room.** A Break Room is justified for all ICS monitoring stations unless a kitchen is justified in its place. Allocate 20 NSF/PN based on the number of people in MCR during the largest shift.

**89051-3.2.8. Kitchen.** A Kitchen may be justified due to base emergency event protocols for self-sufficiency as determined by the base commanding officer. Allocate 30 NSF/PN based on the number of people in MCR during the largest shift.

**89051-3.2.9. Locker Room.** A Locker Room area may be justified based on permanent staff within the MCR. Allocate 10 NSF/Locker/PN based on the number of people in MCR during the largest shift.

**89051-3.2.10. Shower Room.** A Shower Room may be justified due to base emergency event protocols for self-sufficiency as determined by the base commanding officer. Allocate 20 NSF/Shower when required, up to a maximum of two showers.

**89051-3.2.11. Special Purpose Space Circulation.** This space used for circulation within the Special Purpose Spaces. Apply a Special Purpose Space Circulation factor of 10% to the NSF allocated.

**89051-3.2.12. Electrical, Mechanical and Rest Rooms** and other common areas are included within the Net to Gross factor. For an ICS Monitoring Station, apply an overall Net to Gross Factor of 1.35.

**Table 89051-4: Planning Factors for ICS Monitoring Station**

<b>Space Type</b>	<b>NSF Factor/Multiplier</b>
<b>Office and Assembly Space:</b>	
Private Offices	120 NSF/person
Open Offices	64 NSF/person
Administrative Support Space	8 NSF/PN for office space personnel.
Conference Room at Installation Level ICSMS	200 NSF
Conference Room at Regional Level ICSMS	400 NSF
Reception Area at Regional Level ICSMS	164 NSF
Office and Assembly Space Circulation Multiplier	10%
<b>Special Purpose Space:</b>	
ICS Integration and Application Space	200 NSF
IT Storage Space	150 NSF
Master Control Room	90 NSF/Operator Work Station
Reception Area	164 NSF
Server Room	See Table 89051-4
Technical Equipment Area	100 NSF
Bunk Room (for emergency events)	130 NSF
Break Room (apply in lieu of Kitchen)	20 NSF/PN
Kitchen (for emergency events)	30 NSF/PN justified
Locker Room	10 NSF/Locker/PN justified
Shower Room (for emergency events)	20 NSF/Shower
Circulation Multiplier	10%
ICS Monitoring Station NTG Factor:	1.35

Table 89051-5: Example BFR for an ICS Monitoring Station

<b>Space Type: Office and General Purpose Space</b>	Qty	NSF Factor or Multiplier	Subtotal NSF	Total Area NSF
Private Office Space (PN)	4	120		480
Open Office Space (PN)	8	64		512
Administrative Support Space Factor (PN)	12	8		96
Conference Room (EA) Installation	0	200		0
Conference Room (EA) Regional	1	400		400
Reception Area (EA) Regional	1	164		164
Office and Assembly Space Subtotal (NSF)			1,652	
Office and Assembly Space Circulation (NSF)		10%	165	
Total Office and Assembly Space (NSF):				1,817
<b>Space Type: Special Purpose Space</b>				
ICS Integration and Application Space (EA)	1	200		200
IT Storage Space (EA)	1	150		150
Master Control Room (WS)	6	90		540
Server Room (Racks)	4	60		240
Technical Equipment Area (EA)	1	100		100
Break Room (based MCR personnel during largest shift)	8	160		160
Bunk Room for Emergency Events (EA)	0	130		0
Kitchen (based MCR personnel during largest shift)	0	20		0
Locker Room (based MCR personnel during largest shift)	0	10		0
Shower Room (Up to two showers)	0	20		0
Special Purpose Space Subtotal (NSF)			1390	
Circulation Multiplier: (NSF)		10%	139	
Total Special Purpose Space (NSF)				1,529
Total Net Area Subtotal			3346	
Net-to-Gross Factor (NTG)		35%	1,171	
Total Gross Area (GSF)				4,517

**89051-4 PROPERTY RECORD CARD USAGE.** Each ICS Monitoring Station should be listed on an individual property record card. At smaller installations where an ICS Monitoring Station may consist of a single room for an ICS workstation within a public works facility, use CCN 89051 as the utilization for that area of the building.



**890 56      WEIGHTING FACILITY (EA)****FAC 8923****BFR Required N**

No criteria are currently available for this Category Code.

**890 77      STORAGE FOR UTILITY SYSTEMS (READY ISSUE/SHOP STORES/MISC.) (SF)****FAC 8910****BFR Required Y**

**89077-1      DEFINITION.** This facility provides covered storage for large items and materials required for the maintenance of base utility systems to include, but not limited to: spare pole mounted transformers, power cable spools, and large diameter piping. It is independent of the facilities required for the storage of items and materials required for the maintenance of station buildings and grounds (use Category Code 219 77). Because of the size and variation of specific items or materials requiring covered storage included in this category code, warehouse stacking methodology may not apply. When this is the case, a space analysis must be used to develop the BFR.

**892           MISCELLANEOUS UTILITIES-EACH****892 10      MONITORING WELLS (EA)****FAC 8840****BFR Required N**

**89210-1      DEFINITION.** Monitoring wells are for inventory purposes only. Monitoring wells are installed around a site in order to detect the discharge of any leachate. Samples from the wells are to be analyzed prior to the disposal of any waste in order to establish baseline data. Report all wells associated with a single contamination site or single fuel monitoring requirement as one asset and record the quantity of wells per site in the associated property record.

**893 MISCELLANEOUS UTILITIES-LINEAR FEET****893 20 UTILITY CHANNEL-NON COMMUNICATIONS (LF)****FAC 8932****BFR Required N**

**89320-1 DEFINITION.** A utility channel is an underground channel for utility distribution systems (non-communications) that both protects systems and provides relatively easy access for maintenance. A utility channel has a much smaller cross-section than a utility tunnel and does not provide walk-through access. These are generally concrete channels with a series of ground level concrete access panels that constitute the top of the channel structure. For communications maintenance channels, use category code 131 17.

**FACILITIES CRITERIA (FC)**  
**FACILITY PLANNING FOR NAVY AND**  
**MARINE CORPS SHORE INSTALLATIONS**

**Series 900: REAL ESTATE FACILITIES**

**Record of Changes:**

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of Change</b>
10 October 2021	91215	State Owned Land - Hawaii	Change FAC to 9110 Change Title to State Owned Land - Hawaii
10 October 2021	91210	Federal Withdrawn Public Land - Permanent	Change FAC to 9110 Change Title to Federal Withdrawn Public Land - Permanent
10 October 2021	91220	Federal Withdrawn Public Land - Temporary	Change FAC to 9110 Change Title to Federal Withdrawn Public Land - Temporary
10 October 2021	91310	Licensed and Permitted Land	Change FAC to 9110 Change Title to Licensed and Permitted Land
10 October 2021	91310	Licensed and Permitted Land – Temporary Permit	Change FAC to 9110 Change Title to Licensed and Permitted Land – Temporary Permit
10 October 2021	91410	Public Land of Territories or Possessions – Temporary or Long-Term (AC)	Change FAC to 9110 Change Title to Public Land of Territories or Possessions – Temporary or Long-Term (AC)
10 October 2021	91420	Public Land of Territories or Possessions (AC)	Change FAC to 9110 Change title to Public Land of Territories or Possessions (AC)
10 October 2021	92130	Land Easement – By Purchase (AC)	Change FAC to 9110 Change title to Land Easement – By Purchase (AC)
10 October 2021	92140	Land Easement – By Condemnation (AC)	Change FAC to 9110 Change title to Land Easement – By Condemnation (AC)
10 October 2021	92150	Land Easement – By Exchange	Change FAC to 9110 Change title to Land Easement – By Exchange
10 October 2021	92110	Land Easement – Aviation – By Purchase (AC)	Change FAC to 9900 Change title to Land Easement – Aviation – By Purchase (AC)
10 October 2021	92120	Land Easement – Aviation – By Condemnation (AC)	Change FAC to 9900 Change title to Land Easement – Aviation – By Condemnation (AC)

**FC 2-000-05N**

<b>Date</b>	<b>CCN #</b>	<b>CCN Title</b>	<b>Description of Change</b>
10 October 2021	92210	In-Leased Land – Private Enterprise (AC)	Change FAC to 9110
10 October 2021	92220	Land – In Lease – State and Local Governments	Change FAC to 9110
10 October 2021	92230	Land – In Lease – Long-Term (AC)	Change FAC to 9110
10 October 2021	92310	Land – Foreign, 99-Year Lease	Change FAC to 9110
10 October 2021	92320	Land – Foreign, Base Rights	Change FAC to 9110
10 October 2021	92330	Land – Foreign Reciprocal Aid	Change FAC to 9110
10 October 2021	92340	Land – Foreign, Occupied Area	Change FAC to 9110
10 October 2021	92350	Land – Foreign, In-Lease	Change FAC to 9110
10 October 2021	92360	Land – Foreign, Miscellaneous	Change FAC to 9110
25 August 2022	91210, 91220, 92115, 92150	Land	Add descriptive information.
12 September 2022	913-20	Land – Public Domain – Temporary Permit	Change title to “Land – Public Domain – Temporary Permit.”
2 March 2023	900 Series	UFC 2-000-05N	Change UFC 2-000-05N to FC 2-000-05N document due to the fact that this planning criteria is not unified among the other DoD services.
6 February 2024	99002	Water Easement Clearance, Perpetual	Add new category code under Basic Category 990 Land Rights.

**900 SERIES  
REAL ESTATE FACILITIES**

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## **900 REAL ESTATE**

### **900-1 DEFINITION**

This Facility Class applies to real estate in which the Navy has, or intends to obtain, a vested interest. The interest may be acquired by purchase, condemnation, donation, or exchange, and may be held in fee simple, leasehold, or easement. Real estate planned for the Navy is defined under the category codes for classifying real property as found in NACFAC P-72 / Classification is done according to the methods of acquisition and the type of real estate acquired as follows:

- Category Group 910 Land – Government Owned
- Category Group 920 Other Rights
- Category Group 930 Site Improvements

### **900-2 POLICY**

As a general policy, all permanent Naval installations within the United States and its possessions shall be established on land owned in fee by the Federal Government under the custody and accountability of the Department of the Navy. This policy is based on the need for the unconditional use of the land for the unrestricted execution of the assigned military mission.

Additional real estate will not be acquired for the Department of the Navy by any method unless a determination has been made that consistent with the requirements of the military mission, such needs cannot be fulfilled by maximum utilization of the real estate under the control of the three military departments. Current requirements will, in the absence of unusual circumstances, be given preference over anticipated future needs and mobilization requirements. Care must be taken however, to prevent modifications that would interfere with mobilization plans for the property. The following are broad policies of the Department of the Navy in connection with the real estate transactions:

1. To acquire only the real property necessary to meet present and immediately foreseeable requirements;
2. To acquire title or other interest to real property by negotiation and direct purchase wherever possible;
3. To base estimate of value upon appraisals made by private local appraisers or by staff appraisers;
4. To take prompt action to dispose of real property excess to current and foreseeable needs of the Navy;
5. To authorize for private use, after advertising, real property which is temporarily excess to the needs of the Navy and is not required for use by other Federal agencies;
6. To require the payment of fair value for easements granted and for property which is made available for private use under out-leases, licenses or otherwise; and

7. To construct buildings or improvements of permanent type only on lands in which the rights of the Government are fee title or permanent easements.

### **900-3 DETERMINATION OF REQUIREMENTS**

Prior to acquisition of additional land, it shall be determined that the requirements cannot be met by:

1. Exercise of recapture-of-use rights;
2. Use of property excess to the needs of other military departments or another government agency;
3. Exercise of joint use with other agencies;
4. Acquisition of land from public domain; or
5. Transfer from state or municipal governments.

### **900-4 ACQUISITION CODE VERSUS RETENTION CODE**

Real estate is acquired under the 900 Code but is transferred, usually at the end of the fiscal year, to the code under which it is used. Coding in the 900 series denotes the type of interest acquired in the property and the means of acquisition.

### **900-5 REASONS FOR ACQUISITION**

Land is acquired to supply operational and building areas and to provide security and safety clearances. Requirements for real estate are generated by the assignment of missions for which facilities are not available. When a mission has been assigned to a specific activity, the Commanding Officer reviews available facilities and such deficiencies as exist from the basis of a requirement for the expansion of the installation or the development of a new one. These requirements are submitted for CNO approval through the Military Construction Review Board procedures. See NAVFAC P-73, Real Estate Administration, for the detailed procedures.

### **900-6 AUTHORITY TO ACQUIRE REAL PROPERTY**

The authority to acquire real property and execute real estate functions is vested in the Naval Facilities Engineering Command. Authority to acquire real property must be supported by legislative authorization with an appropriation of funds available for that purpose.

### **900-7 DELEGATION OF AUTHORITY**

Authority is delegated to the field offices from time to time for certain functions in relation to real property. This delegation is made to the Commanders/CC's, Naval Facilities Engineering Command Field Divisions.



**900-8 LEGISLATIVE AUTHORIZATION (MCON ACTS)**

Navy Department land acquisitions usually are provided for in Acts of Congress authorizing construction projects at naval installations. These Acts are commonly known as Military Construction Acts (MCON Acts). They are sometimes referred to as Public Works Authorization Acts.

**900-9 ACQUISITION COST**

Acquisition exceeding \$50,000 is included with the MCON Acts as a line item for action of the Congress. Acquisition not exceeding \$25,000 is vested in the Secretary of the Navy. This authority is for land or real property interest determined necessary for national defense. The authority for expenditure of up to \$25,000 may not be used to acquire two or more contiguous parcels that together cost more than \$50,000. The detailed method of acquisition is found in NAVFAC P-73, Real Estate Procedural Manual.

**910 LAND - GOVERNMENT OWNED**

910-1 **GOVERNMENT OWNED LANDS.** All land interests are included in Category Group 910 with the exception of easement rights, in-lease rights, and foreign rights which are in Category Group 920.

**911 LAND - PERMANENT USE LAND**

911-1 **PERMANENT USE LAND.** This basic category includes lands acquired in fee purchase, condemnation, donation, exchange or transfer, which is owned in fee by the Federal Government, and under custody and accountability of the Department of the Navy.

**911 10 LAND – PURCHASE (AC)****FAC 9110****BFR Required N**

91110-1 **PURCHASE.** Land acquired in fee by purchase is a negotiated sale of the property from private owners to the Federal Government by conveyance of deed.

**911 20 LAND – DONATION (AC)****FAC 9110****BFR Required N**

91120-1 **DONATION.** Land acquired in fee by donation usually consists of a conveyance of fee title by the donor without monetary consideration.

**911 30 LAND – TRANSFER (AC)**  
**FAC 9110**  
**BFR Required N**

**911 40 LAND – CONDEMNATION (AC)**  
**FAC 9110**  
**BFR Required N**

91140-1 **CONDEMNATION.** Land is acquired by condemnation where land is essential for a project which affects national defense or security, and the consideration for purchase cannot be mutually agreed upon between the owner and the Navy.

**911 50 LAND – EXCHANGE (AC)**  
**FAC 9110**  
**BFR Required N**

91150-1 **EXCHANGE.** Land acquired by exchange is similar in principle to acquisitions by purchase except that the consideration is by land value rather than cash. Land exchange may be negotiated at the Field Engineering Division level between the Navy and private owners after approval by the interested bureau or office and the Naval Facilities Engineering Command. For value exceeding \$50,000, approval by the Congressional Armed Services Committees is required.

## **912 LAND - PUBLIC DOMAIN WITHDRAWAL**

912-1 **GENERAL.** The Navy Department may acquire land by withdrawal from public domain under jurisdiction of the Department of the Interior. Withdrawals of less than 5,000 acres are made by Public Land Order. Withdrawal of more than 5,000 acres for any one project must be approved by Act of Congress. In addition to securing authorization from the Armed Services Committees of Congress, a bill must be introduced in the Committees on Public Land and Insular Affairs for acquisition of public domain lands in excess of 5,000 acres. Land withdrawn from public domain is coded as follows:

**912 10 FEDERAL WITHDRAWN PUBLIC LAND-PERMANENT (AC)**  
**FAC 9110**  
**BFR Required N**

91210-1 **GENERAL.** This category code involves Federal Government land permanently excluded from some or all forms of entry, use, sale, or other disposal under the public lands laws as specified in the public land order, executive order, or act of Congress and those lands that are reserved for a specified department or agency for a specific public purpose.

**912 15 STATE OWNED LAND-HAWAII (AC)**  
**FAC 9110**  
**BFR Required N**

91215-1 **GENERAL.** This category code includes Federal Government land reserved through land trust in the State of Hawaii.

**912 20 FEDERAL WITHDRAWN PUBLIC LAND-TEMPORARY (AC)**  
**FAC 9110**  
**BFR Required N**

91220-1 **GENERAL.** This category code involves Federal Government land permanently excluded from some or all forms of entry, use, sale, or other disposal under the public lands laws as specified in the public land order, executive order, or act of Congress and those lands that are reserved for a specified department or agency for a specific public purpose for a specified period of time.

**913 LAND - LICENSE OR PERMIT (AC)**

913-1 **GENERAL.** This category code does not include land acquired by a withdrawal from public domain.

**913 10 LICENSED AND PERMITTED LAND (AC)**  
**FAC 9110**  
**BFR Required N**

91310-1 **GENERAL.** This land is acquired for temporary use under license or permit. The license or permit is a privilege, revocable at will, to use the property of the licensor, for a specified purpose and period of time.

**913 20 LAND – PUBLIC DOMAIN – TEMPORARY PERMIT (AC)**  
**FAC 9110**  
**BFR Required N**

91320-1 **GENERAL.** Land from Public Domain used under temporary permit is obtained under agreement between the Navy Department, and the Department of the Interior. The temporary permit implies no use detrimental to the land such as contamination.

**914 PUBLIC LAND - TERRITORIES AND POSSESSIONS**

914-1 **GENERAL.** Land from U.S. possessions is acquired for temporary or long-term use by Executive Order or permit agreement for a limited specific use.

**914 10 PUBLIC LAND OF TERRITORIES OR POSSESSIONS-  
 TEMPORARY OR LONG-TERM (AC)**  
**FAC 9110**  
**BFR Required N**

91410-1 **GENERAL.** This code is used for public land of U.S. possessions acquired and used under long-term agreements or temporary agreements.

**914 20 PUBLIC LAND OF TERRITORIES OR POSSESSIONS (AC)**  
**FAC 9110**  
**BFR Required N**

91420-1 **GENERAL.** This code is used to designate public land of U.S. possessions assigned to the Navy on temporary permit.

**920 LAND OTHER RIGHTS**

920-1 **GENERAL.** This category group includes easements, leases, and foreign rights.

**921 LAND – EASEMENT**

921-1 **GENERAL.** An easement is a conveyance of interest in real property for particular purposes and needs of the Navy. An easement is acquired by deed for a term of years or in perpetuity. The grantor of an easement may continue to use the land within the stipulations of the easement.

**921 10 LAND EASEMENT – AVIATION - BY PURCHASE (AC)**  
**FAC 9900**  
**BFR Required N**

92110-1 **GENERAL.** An aviation easement is purchased to convey certain property rights from the private owner to the Federal Government. This is done by conveyance of deed. Easements are acquired to insure free and unobstructed aircraft passage through the airspace. The easement provides the right to limit structure height and natural growth.

**921 20 LAND EASEMENT- AVIATION - BY CONDEMNATION (AC)**  
**FAC 9900**  
**BFR Required N**

92120-1 **GENERAL.** This code varies from 921 10 only in the method of acquisition. Possession is obtained by condemnation only when the purchase price cannot be mutually agreed upon between the owner and the Navy.

**921 30 LAND EASEMENT - BY PURCHASE (AC)**  
**FAC 9110**  
**BFR Required N**

92130-1 **GENERAL.** Easements other than for navigation are acquired by negotiated sale. These easements provide rights-of-way for typical utility lines and access roads as well as many other purposes, including restrictions on use.

**921 40 LAND EASEMENT - BY CONDEMNATION (AC)**  
**FAC 9110**  
**BFR Required N**

92140-1 **GENERAL.** This is similar to 921 30 but differs in that agreement on a negotiated easement cannot be reached, and the easement is obtained by condemnation for reason of national defense or security.

**921 50 LAND - EASEMENT BY EXCHANGE (AC)**  
**FAC 9110**  
**BFR Required N**

92150-1 **GENERAL.** This category code is similar to 92130, but differs in that consideration is land value in lieu of cash.

## 922 LAND - IN-LEASED

922-1 **GENERAL.** An in-lease is a conveyance of a possessory interest in real property for a term of years for rent or other consideration. Leased property is categorized under three groups as follows.

### 922 10 LAND - IN-LEASE - PRIVATE ENTERPRISE (AC)

**FAC 9110**

**BFR Required N**

92210-1 **GENERAL.** This land is leased from private owners for periods under 25 years.

### 922 20 LAND - IN-LEASE - STATE AND LOCAL GOVERNMENTS (AC)

**FAC 9110**

**BFR Required N**

92220-1 **GENERAL.** This land is leased from State and local governments for periods under 25 years.

### 922 30 LAND - IN-LEASE - LONG-TERM (AC)

**FAC 9110**

**BFR Required N**

92230-1 **GENERAL.** Land in-lease for 25 years or more is categorized as "long-term". The land may be leased from private enterprise, or State or local governments.

## 923 LAND - FOREIGN RIGHTS

923-1 **GENERAL.** This is land under custody and accountability of the Navy Department comprising a Navy installation in a foreign country except land under easement, Code 921. The method of acquisition or use of real property in a foreign country depends upon, and is accomplished by, diplomatic agreement and subsidiary military agreements or, where applicable, by lease or other agreement. Fee simple title to real property in a foreign country is not acquired. The extent of interest which may be acquired in such property depends upon the agreement. Acquisition or use of real property in an occupied country is accomplished by requisition or other local arrangements. The Navy codes for foreign rights are as follows:

**923 10**     **LAND - FOREIGN, 99-YEAR LEASE**  
**FAC 9110**  
**BFR Required N**

**923 20**     **LAND - FOREIGN, BASE RIGHTS**  
**FAC 9110**  
**BFR Required N**

**923 30**     **LAND - FOREIGN RECIPROCAL AID**  
**FAC 9110**  
**BFR Required N**

**923 40**     **LAND - FOREIGN, OCCUPIED AREA**  
**FAC 9110**  
**BFR Required N**

**923 50**     **LAND - FOREIGN, IN-LEASE**  
**FAC 9110**  
**BFR Required N**

**923 60**     **LAND - FOREIGN, MISCELLANEOUS**  
**FAC 9110**  
**BFR Required N**

**931**         **BUILDINGS**

**932**         **STRUCTURE/UTILITY SITE IMPROVEMENTS**

932-1         **GENERAL.** This code group is for site improvements which are not associated with a specific building or structure within its own category code such as clearing, grading, landscaping, erosion control, and similar. This group contains the following individual codes:

**933 DEMOLITION**

933-1 **GENERAL.** This group is for demolition of buildings, structures, or utilities and removal of debris performed primarily to make usable or disposable an otherwise unusable site. Demolition directly related to a construction project is assigned the same code as for the project.

**990 LAND RIGHTS****990 02 WATER EASEMENT CLEARANCE, PERPETUAL (AC)****FAC 9900****BFR Required N**

99002-1 **GENERAL.** This category code applies to non-possessory interest in waterways used for mitigating encroachment that can limit or restrict military training, testing, and operations.



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
100						OPER & TRNG FAC			
110						AIRFIELD PAVEMENTS			
111						RUNWAYS			
Series 111 Category Codes include criteria for runways for fixed wing aircraft and runways or landing pads for rotary wing aircraft. Runways are prepared surfaces for the landing and takeoff of both fixed wing and rotary wing aircraft. Landing pads are prepared surfaces for the Vertical Takeoff and Landing (VTOL) of rotary wing aircraft (including V-22).									
11110	1111	LS	[SY]	LF		RUNWAY / FW	Y		PREPARED SURFACES FOR THE LANDING AND TAKEOFF OF AIRCRAFT.
11112	1114	LS	[SY]	LF		RUNWAY/FIXED- WING-UNSURFAC	Y		RUNWAYS FOR ROTARY WING AIRCRAFT THAT DO NOT CONSIST OF A PAVEMENT OR HARDSTAND SURFACE.
11115	1112	LS	[SY]	LF		RUNWAY / ROTARY WING	Y		PREPARED SURFACES FOR THE LANDING AND TAKEOFF OF HELICOPTERS.
11120	1112	LS	[SY]			HELICOPTER LANDING PAD	Y		PREPARED AREA FOR THE HOVERING, VERTICAL TAKEOFF AND LANDING (VTOL) OF HELICOPTERS AND OTHER VTOL AIRCRAFT.
11125	1111	LS	[SY]			FW A/C (VTOL) LANDING PAD	Y		A LANDING/TAKEOFF PAD FOR VTOL AIRCRAFT SUCH AS THE HARRIER AND JOINT STRIKE FIGHTER.
11130	1113	LS	[SY]			RUNWAY OVERRUN - PAVED	Y		AREAS EXTENDING AT EACH END OF A RUNWAY. THE RUNWAY OVERRUN AREAS ARE REQUIRED TO REDUCE SERIOUS DAMAGE TO AN AIRCRAFT IN THE EVENT THAT THE AIRCRAFT RUNS OFF OF THE RUNWAY END DURING TAKEOFF OR LANDING.
112						TAXIWAYS			
11210	1121	LS	[SY]	LF		TAXIWAY	Y		TAXIWAYS ARE PAVED SURFACES ON WHICH AIRCRAFT, BOTH FIXED AND ROTARY WING, MOVE UNDER THEIR OWN POWER TO AND FROM LANDING, SERVICE AND PARKING AREAS.
113						APRONS			
All outdoor pavements used for parking aircraft, and for the loading, unloading and servicing of aircraft in addition to providing parking space.									
11320	1131	LS	[SY]			AIRCRAFT PARKING APRON	Y		PARKING APRONS ARE REQUIRED FOR LOADING, UNLOADING AND SERVICING OF AIRCRAFT AND PROVIDING PARKING SPACE.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
11340	1131	LS	[SY]			AIRCRAFT ACCESS APRON	Y	AIRCRAFT ACCESS APRONS PROVIDE ACCESS TO AIRCRAFT MAINTENANCE HANGARS FROM THE AIRCRAFT PARKING APRON.	
116						AIRFIELD PAVEMENTS - OTHER			
Miscellaneous airfield pavements, other than runways, taxiways, and aprons, such as washracks, rinse facilities, compass calibration pads, arming/de-arming pads, Ground Controlled Approach (GCA) pads, blast protective pavement, line vehicle parking, towways, ordnance handling pads, fire and rescue vehicle alert pads, and tactical support van pads.									
11610	1163	LS	[SY]			AIRCRAFT WASHRACK PAVEMENT	Y	AIRCRAFT WASHRACKS ARE PROVIDED AT ALL AIR INSTALLATIONS FOR CLEANING OF AIRCRAFT.	
11612	1165	LS	[SY]			AIRCRAFT PAVEMENT SHOULDER	Y	THE AREA EXTENDING Laterally FROM THE EDGE OF THE RUNWAY PAVEMENT.	
11615	1167	LS	[SY]			AIRCRAFT RINSE FACILITY	Y	AN AIRCRAFT RINSE FACILITY PROVIDES AN UNATTENDED TAXI- THROUGH, TREADLE OPERATED, FRESHWATER DELUGE SYSTEM TO RINSE AIRCRAFT.	
11620	1161	LS	[SY]			ACFT COMPASS CALIBRATE PAD	Y	A PAVED AREA IN A MAGNETICALLY QUIET ZONE WHERE THE COMPASS IN THE AIRCRAFT IS CALIBRATED.	
11635	1131	LS	[SY]			ARMING & DE- ARMING PAD	Y	A PAVED AREA FOR ACTIVATING OR DEACTIVATING WEAPONS SYSTEMS ON- BOARD AIRCRAFT.	
11640	1164	LS	[SY]			PREC APPR RADAR PAD	N	PRECISION APPROACH RADAR (PAR) PAD IS A PAVED HARDSTAND PROVIDED TO SUPPORT THE PAR EQUIPMENT IN OPERATING POSITION.	
11642	1164	LS	[SY]			BLAST PROTECTIVE PAVEMENT	N	BLAST PROTECTIVE PAVEMENT IS PROVIDED ADJACENT TO THE RUNWAY THRESHOLD AND END TURNOFF FOR JET RUNWAYS TO PROTECT PAVEMENT FROM DAMAGE DUE TO JET BLAST.	
11645	1164	LS	[SY]			LINE VEHICLE PARKING	N	LINE VEHICLE PARKING SPACES CONTIGUOUS TO TAXIWAY AND PARKING APRONS ARE ALLOCATED FOR GROUND SUPPORT EQUIPMENT ASSIGNED FOR FLIGHT LINE USE.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
11650	1131	LS	[SY]			TOWWAY	N	A TOWWAY IS A PAVED ROADWAY USED FOR TOWING FIXED OR ROTARY WING AIRCRAFT.	
11655	1131	LS	[SY]			ORDNANCE HANDLING PAD	Y	AN ORDNANCE HANDLING PAD IS PROVIDED FOR AIR INSTALLATIONS WHERE THERE IS A REQUIREMENT FOR LOADING OR OFF-LOADING EXPLOSIVES FROM CARGO AIRCRAFT.	
11656	1131	LS	[SY]			CMBT A/C LOADING AREA	Y	A COMBAT AIRCRAFT LOADING AREA (CALA) IS PRIMARILY AN APRON WHERE EXPLOSIVES ARE LOADED/OFF-LOADED FROM COMBAT AIRCRAFT DEPARTING AND/OR RETURNING FROM WEAPONS TRAINING FLIGHTS.	
11660	1164	LS	[SY]			FIRE / RESCUE VEHICLE PAD	N	THIS FACILITY PROVIDES A PARKING AREA FOR IMMEDIATE RESPONSE ALERT VEHICLE.	
11665	1164	LS	SY	[EA]		TACTICAL SUPPORT LAYDOWN	Y	A CONCRETE PAD FOR THE PARKING OF TACTICAL VEHICLES OR EQUIPMENT.	
120						LIQUID FUELNG & DISPNG FAC			
121						AIRCRAFT FUELNG/DISPNG FAC			
<p>Refueler trucks are the preferred method to fuel aircraft. However, direct fueling stations may be considered for: (1) carrier aircraft, including helicopters, when the mission dictates a continuing need for rapid turnaround without shutting engines down, (2) cargo/transport aircraft with prescribed short ground times or (3) patrol aircraft which require an average refueling of 2500 gallons or more.</p>									
12110	1211	S		OL	[GM]	ACFT DIRECT FUELING STA	Y	AIRCRAFT DIRECT FUELING STATIONS PROVIDE OUTLETS WHERE AIRCRAFT CAN BE FUELED FROM A CLOSED CIRCUIT FUEL SYSTEM AS OPPOSED TO REFUELER TRUCKS.	
12120	1261	S		OL	[GM]	ACFT TRUCK FUELING FAC	Y	AN AIRCRAFT TRUCK FUELING FACILITY IS USED TO TRANSFER FUEL TO AIRCRAFT REFUELING TRUCKS.	
12130	1212	S		OL	[GM]	AIRCRAFT DEFUELNG FACILITY	N	THIS CATEGORY CODE IS FOR DEFUELING AIRCRAFT OF EXCESS OR RESIDUAL FUEL. AIRCRAFT SHALL BE DEFUELED INTO TANK TRUCKS DESIGNATED FOR THAT PURPOSE.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
12150	1241	S	[GA]			ACFT READY FUELS STORAGE	Y	AIRCRAFT READY FUEL STORAGE PROVIDES AN OPERATION AND RESERVE SUPPLY OF AVIATION GASOLINE AND JET FUEL.	
<hr/>									
122						MARINE FUEL DISPENSING			
<p>This basic Category Code includes the following: Marine fueling facilities designed for small vessels and capital ships that should be able to refuel the largest ship that can dock at the station's waterfront. Small craft fueling stations used to refuel such small craft as crash boats and administrative boats. Marine ready fuel storage tanks for the ready issue operation storage of a particular grade of fuel for small boats and yard craft.</p>									
12210	1221	S	OL	[GM]		MARINE FUELING FACILITY	Y	A MARINE FUELING FACILITY IS DESIGNED FOR SMALL VESSELS AND CAPITAL SHIPS AND SHOULD BE ABLE TO REFUEL THE LARGEST SHIP THAT CAN DOCK AT THE STATION'S WATERFRONT.	
12220	1221	S	OL	[GM]		SMALL CRAFT FUELING STA	Y	A SMALL CRAFT FUELING STATION IS USED TO REFUEL SUCH SMALL CRAFT AS CRASH BOATS AND ADMINISTRATIVE BOATS. IT SHALL INCLUDE DISPENSING PEDESTAL-TYPE COMMERCIAL PUMPS, PIPING, TANKS, HOSES, FLOODLIGHTS AND GROUNDING DEVICES, ELECTRICAL POWER, AND FIRE PROTECTION.	
12230	1242	S	[GA]			SM CRAFT READY FUEL STRG	Y	A MARINE READY FUEL STORAGE TANK IS THE READY ISSUE OPERATIONAL STORAGE OF A PARTICULAR GRADE OF FUEL FOR SMALL BOATS. (E.G. SMALL TUGS, SECURITY BOATS, REPAIR BARGES AND YARD CRAFT)	
<hr/>									
123						LAND VEH FUELNG/DISPNG FAC			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
<p>This Category Code group is for facilities serving official government land vehicles and equipment only. If NEX operates the facility, see Category Code 740-30/31, Exchange Service and Auto Repair/Supplemental Gasoline Station. For Aviation Fueling and Dispensing, see Category Code Series 121. For Marine and Small Craft Fueling and Dispensing, see Category Code series 122. For bulk fuel storage such as tank farm installation, see Category Code series 411.</p>									
12310	1231	S	[OL]	GM		FILLING STATION	Y		A FILLING STATION IS A FUELING FACILITY FOR OFFICIAL VEHICLES AND EQUIPMENT ON NAVY AND MARINE CORPS INSTALLATIONS. THIS CATEGORY CODE APPLIES TO PUMP OUTLETS INCLUDING THE COVERED ISLANDS THAT SUPPORT THE PUMP OUTLETS, THE CONCRETE PARKING AREA, LIGHTING AND THE ACCESS PAVING TO THE PUMPS/ISLANDS.
12315	8910	B	[SF]			FILLING STATION BUILDING	Y		THIS CODE IS USED FOR REPORTING THE ADMINISTRATIVE SHELTER ASSOCIATED WITH A FILLING STATION. IF THE FILLING STATION IS OPERATED BY A PRIVATE ENTITY, THEN USE THE 740-30/31 CATEGORY CODES. WHERE CREDIT CARD SYSTEMS ARE USED AND OPERATORS ARE NOT NEEDED, A SHELTER IS NOT REQUIRED.
12316	1459	S	[SF]	EA		OVERHEAD COVER, AIRFIELD	N		THIS CATEGORY CODE CAN BE USED FOR OVERHEAD COVERS LOCATED ON THE AIRFIELD (THAT ARE NOT CLASSIFIED AS EQUIPMENT).
12317	1459	S	[SF]	EA		OVERHEAD COVER, MISC	N		THIS CATEGORY CODE CAN BE USED FOR OVERHEAD COVERS LOCATED AT THE MAIN GATES OF INSTALLATIONS, OVERHEAD COVERS ATOP GAS PUMPS, AND ANY OTHER TIME THAT AN OVERHEAD COVER IS USED.
12330	1243	S	[GA]			VEH & EQUIP RDY FUEL STOR	Y		THIS CODE IS USED FOR REPORTING THE TANK STORAGE REQUIREMENT ASSOCIATED WITH CATEGORY CODE 123 10 AND 740 30, INCLUDING THOSE TANKS IN REMOTE LOCATIONS THAT ARE CONSIDERED REAL PROPERTY.
12340	1243	S	[GA]			ETHANOL RDY FUEL STOR	Y		THIS CATEGORY IS FOR ALTERNATIVE FUEL FACILITIES IN SUPPORT OF ETHANOL OPERATION OF VEHICLES.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
12350	1243	S		[GA]		BIODIESEL READY FUEL STOR	Y	THIS CATEGORY IS FOR ALTERNATIVE FUEL FACILITIES IN SUPPORT OF BIODIESEL OPERATION OF VEHICLES.	
124						OPERATING FUEL STORAGE			
125						POL PIPELINE			
This category is for pipelines and accessory equipment between tank farms and operating fuel storage facilities and intermediate points.									
12510	1251	LS		[LF]		POL PIPELINE MULTI SITES	N	TRANSFER PIPELINES USED FOR THE TRANSFER AND TRANSPORT OF PETROLEUM, OILS, LUBRICANTS AND FUELS BETWEEN SITES.	
12516	1262	S		[GM]	EA	POL PIPELINE PUMP STA	N	PUMPING STATIONS AND ANCILLARY EQUIPMENT USED TO MOVE THE FUEL THROUGH THE PIPES. THIS FACILITY MAY ALSO INCLUDE CONTROLS, GAUGES, METER, LIGHTING, FIRE PROTECTION, AND VENTILATION.	
12520	1459	S	[SF]		EA	SHLTR FOR PUMP STA	N	THIS IS USED FOR STRUCTURES HOUSING PUMPING STATIONS AND ANCILLARY EQUIPMENT.	
12521	1252	LS		[LF]		POL PIPING- SINGLE SITE	N	POL PIPELINES USED FOR THE TRANSFER AND TRANSPORT OF PETROLEUM, OILS, LUBRICANTS AND FUELS WITHIN A SITE (EXCEPT THOSE WITHIN A MARINE OR AIRCRAFT FUELING FACILITY).	
12530	1244	S		[GA]		SURGE STORAGE	N	A SURGE TANK IS USED WHERE THERE IS A RISK OF HYDRAULIC SHOCK. HYDRAULIC SHOCK CAN OCCUR WHEN THE PUMP USED TO DELIVER FUEL IS GREATER THAN THE PIPELINE CAPACITY; UNLOADING RATE OF THE DELIVERY TANKER/BARGE EXCEEDS THE RATE OF THE SHORE PUMPING SYSTEM; OR WATER, AIR OR OTHER BLOCKAGE OCCURS IN THE PIPELINE.	
126						OTHER LIQUID FUELNG/DISPNG			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		

Use this Category Code for liquid fuel or petroleum products facilities not specifically related to aviation, marine craft, or ground vehicle fuel requirements (see Category Codes series 121, 122, and 123, respectively). Use Category Code 821 60 or 821 61 for heating plant fuel storage. This Category Code includes fuel loading and unloading; drum storage, loading and maintenance; and miscellaneous fuel storage (i.e., heating fuel, kerosene, propane, fuel oil, etc.). See Category Code series 411 for depot level storage.

12610	1261	S	[OL]	EA	DRUM AND CAN LDING FAC	Y	A DRUM AND CAN LOADING FACILITY IS A FUEL FACILITY EQUIPPED TO FILL DRUMS WITH FUEL OIL, DIESEL, KEROSENE, JET ENGINE FUEL, MOTOR GASOLINE, AVIATION GASOLINE, AND LUBRICATING OILS. THE FACILITY MAY ALSO BE PROVIDED WITH A DRUM RECONDITIONING PLANT.
12615	1244	S	[GA]		PETROLEUM RDY FUEL STOR FA	Y	THIS CATEGORY SHALL BE USED FOR THE STORAGE OF PETROLEUM PRODUCTS USED TO FILL DRUMS AS PROVIDED IN CATEGORY CODE 126 10, HEATING OIL TANKS (SEE CATEGORY CODE 821-60 OR 61 FOR HEATING PLANT FUEL STORAGE), LUBE OIL TANKS, GREASE, PROPANE TANKS, OR FUEL STORAGE TANKS FOR GENERATORS AND OTHER EQUIPMENT.
12630	1261	S	[OL]		TANK TRUCK/CAR LOAD FAC	Y	A TANK TRUCK LOADING FACILITY (EITHER A TRUCK FILL STAND OR STANDS) DISPENSE FUELS OTHER THAN AIRCRAFT FUELS TO DELIVERY TRUCKS. EACH STAND HAS ONE DUAL OUTLET, A METER, STATIC LINE, PLATFORM, ROADWAY, STRAINER AND NECESSARY VALVES, PIPING, PUMP, AND ELECTRICAL CONTROLS
12640	1261	S	[OL]		TANK TRUCK/CAR UNLOAD FAC	Y	A TANK CAR UNLOADING FACILITY UNLOADS LIQUID PRODUCTS FROM TANK CARS. EACH FACILITY HAS STATIC LINES, STRAINER, ACCESS ROAD, SECURITY FENCING, LIGHTING, NECESSARY VALVES, PIPING, PUMP, ELECTRICAL CONTROLS, AND A SHELTER STRUCTURE FOR USE OF ACCOUNTING AND/OR CONTROL HOUSE.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
131						COMMUNICATIONS - BUILDINGS			
<p>This group of Shore Facilities supports the reception, processing, distribution, and/or transmission of classified and unclassified voice, data, and video communications in support of the Department of Navy operational missions.</p>									
13110	1311	B	[SF]			CABLE HOUSE	Y		A CABLE HOUSE IS AN UNMANNED FACILITY THAT FUNCTIONS EITHER AS AN EXTERNAL JUNCTION POINT FOR COAXIAL CABLES, OR AS MECHANICAL SPACE FOR SUPPORT EQUIPMENT ASSOCIATED WITH EXTREMELY LOW FREQUENCY (ELF) AND VERY LOW FREQUENCY (VLF) ANTENNAS.
13115	1311	B	[SF]			COMM, INFO, OR INTEL FAC	Y		COMMUNICATIONS, INFORMATION, OR INTELLIGENCE FACILITIES ARE RESPONSIBLE FOR INFORMATION PROCESSING, DELIVERY OF INFORMATION SERVICES, AND INFORMATION/DATA STORAGE. THESE ULTIMATELY SUPPORT THE JOINT INFORMATION ENVIRONMENT (JIE). THE JIE IDENTIFIES SEVERAL DIFFERENT TYPES OF FUNCTIONAL NODES: COMPUTING NODES (E.G. DATA CENTERS), COMMUNICATION NODES (E.G. NETWORK GATEWAYS), AND OPERATIONS NODES (E.G. ENTERPRISE OPERATION CENTERS). THESE NODES SHOULD BE VIEWED AS FUNCTIONAL ENCLAVES, NOT SEPARATE FACILITIES; IN FACT, MULTIPLE NODES AND NODE TYPES MAY BE PRESENT IN A SINGLE PHYSICAL FACILITY.
13120	1311	B	[SF]			COMMS RELAY BLDG	Y		A COMMUNICATIONS RELAY FACILITY IS AN UNMANNED FACILITY OR ENCLOSURE ASSOCIATED WITH THE OPERATION OF MICROWAVE (MW) COMMUNICATIONS SYSTEMS. IT CONTAINS RACK MOUNTED COMMUNICATIONS RECEIVING, AMPLIFICATION, AND TRANSMITTING EQUIPMENT, ALONG WITH AN UNINTERRUPTIBLE POWER SOURCE (UPS) AND AN EMERGENCY GENERATOR.



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
13122	1311	B	[SF]			VHF/UHF COMMS FAC	Y	A VHF/UHF COMMUNICATIONS FACILITY CAN EITHER BE CONTAINED WITHIN A PERMANENT FACILITY OR WITHIN CLASS III PROPERTY. IT CONTAINS A LIMITED AMOUNT OF RACK MOUNTED COMMUNICATIONS RECEIVING, AMPLIFICATION, AND TRANSMITTING EQUIPMENT ASSOCIATED WITH AIRFIELD OPERATIONS, SECURITY AND FIRE OPERATIONS, OR AN TACTICAL COMMUNICATIONS SYSTEM INTEGRAL TO UNIQUE SPECIAL OPERATIONS.
13124	1312	B	[SF]			SAT COMMS FAC	Y	A SATELLITE COMS FACILITY IS OFTEN REFERRED TO AS A `GATEWAY FACILITY¿ SUPPORTING WORLDWIDE, REGIONAL, AND AREA OF RESPONSIBILITY (AOR) COMS. IT CONTAINS DIVISION LEVEL OFFICE AND SUPPORT REQUIREMENTS, EQUIPMENT AND OPERATIONAL AREAS, MAINTENANCE AND TRAINING AREAS, AND LIMITED STORAGE AREAS FOR READY-TO-ISSUE COMS SYSTEMS AND SUBSYSTEMS REQUIRED FOR INCOMING AND OUTGOING COMS TRAFFIC.
13125	1311	B	[SF]			TELEMETRY BUILDING	Y	A TELEMETRY BUILDING IS AN EXTREMELY SPECIALIZED AND UNIQUE FACILITY SPECIFICALLY DESIGNED FOR THE TRACKING OF MISSILES AND SATELLITES.
13130	1311	B	[SF]			HELIX HOUSE	Y	A HELIX HOUSE CONTAINS A HELICAL COIL AND ASSOCIATED ANTENNA TUNING DEVICES DIRECTLY ASSOCIATED WITH, AND INTEGRAL TO, THE TRANSMISSION OF LOW FREQUENCY (LF), VERY LOW FREQUENCY (VLF), AND EXTREMELY LOW FREQUENCY (ELF) COMMUNICATIONS.
13135	1311	B	[SF]			RECEIVER BUILDING	Y	A RECEIVER BUILDING SUPPORTS A 24 HOUR A DAY, 7 DAY A WEEK OPERATIONAL REQUIREMENT FOR SHORE TO SHORE AND SHIP TO SHORE ADMINISTRATIVE, TACTICAL, AND STRATEGIC HIGH FREQUENCY (HF) COMMUNICATIONS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG IND.	DESCRIPTION
			AREA	OTHER	ALT			
13140	1311	B	[SF]			TELEPHONE EXCHANGE BLDG	Y	A TELEPHONE EXCHANGE BUILDING CAN SUPPORT WORLDWIDE, REGIONAL AND AREA COMMUNICATIONS FOR A NAVAL SHORE ACTIVITY. THE TELEPHONE EXCHANGE BUILDING CAN CONTAIN THE TELEPHONE SWITCH, MAIN DISTRIBUTION FRAME, INTERMEDIATE DISTRIBUTION FRAME, STAFF SUPPORT SPACES, OPERATORS WORK POSITIONS, MAINTENANCE AND STORAGE SPACES, AND IS SUPPORTED BY UPS AND EMERGENCY GENERATORS.
13142	1311	B	[SF]			AUTO COMMS SWITCH CNTR	Y	AN AUTOMATIC-COMMUNICATIONS SWITCHING-CENTER IDENTIFIES A FACILITY THAT CONTAINS THE TELEPHONE SWITCH AND ITS IMMEDIATE SUPPORT INFRASTRUCTURE. ALTHOUGH IT IS POSSIBLE THAT SOME ISOLATED EXAMPLES OF THIS CONFIGURATION MAY STILL EXIST, THE CURRENT COMMUNICATIONS ARCHITECTURE FOR THIS EQUIPMENT PLACES IT WITHIN A TELEPHONE EXCHANGE BUILDING
13145	1311	B	[SF]			TERMINAL EQUIPMENT BLDG	Y	THIS FACILITY ORIGINALLY, AND CURRENTLY TO A MINOR EXTENT, PERFORMS AS A SINGLE-FUNCTION BUILDING THAT IS IN DIRECT SUPPORT OF HIGH FREQUENCY (HF) OR LOW FREQUENCY (LF) COMMUNICATIONS. IT PROVIDES AN INTERMEDIATE CONNECTION POINT THAT IS REQUIRED TECHNICALLY TO SUPPORT COMMUNICATIONS CONFIGURATION, OR IS REQUIRED AS THE RESULT OF WAVEGUIDE OR CABLE LOSS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
13150	1311	B	[SF]			TRANSMITTER BUILDING	Y	A TRANSMITTER BUILDING SUPPORTS A 24 HOUR A DAY, 7 DAY A WEEK OPERATIONAL REQUIREMENT FOR SHORE TO SHORE AND SHORE TO SHIP ADMIN, TACTICAL, AND STRATEGIC HIGH FREQUENCY (HF), LOW FREQUENCY (LF), VERY LOW FREQUENCY (VLF) AND EXTREMELY LOW FREQUENCY (ELF) COMS. A SMALL PERSONNEL SUPPORT SPACE CONTAINING A TOILET FACILITY AND BREAK AREA IS CONSIDERED PART OF THE FACILITY.	
13155	1311	B	[SF]			CIRC DISP ANT ARRAY BLDG	N	A CIRCULARLY DISPOSED ANTENNA ARRAY (CDAA) BUILDING IS A HIGH FREQUENCY DIRECTION FINDING (HFDF) FACILITY THAT CONTAINS THE TUNING AND RECEIVING EQUIPMENT ASSOCIATED WITH THE AN/FRD-10 ANTENNA.	
13156	1311	B	[SF]			DIRECTION FINDER BUILDING	N	A DIRECTION FINDER BUILDING IS A HIGH FREQUENCY DIRECTION FINDING (HFDF) FACILITY THAT CONTAINS THE TUNING AND RECEIVING EQUIPMENT ASSOCIATED WITH THE AN/FRD-13 ANTENNAS. IT IS ASSOCIATED WITH FUNCTIONS PERFORMED BY VARIOUS DON COMMUNICATIONS, INTELLIGENCE, AND OPERATIONAL MISSIONS.	
13160	1311	B	[SF]			MIL AFFIL RADIO STA (MARS)	N	THE MILITARY AFFILIATE RADIO SYSTEM IS PART OF NAVY TELECOMMUNICATIONS COMPLEX. SIZE OF THE STATION VARIES WITH THE TYPE OF OPERATIONS AND EQUIPMENT USED. AS A GENERAL RULE, THE SPACE FOR A MARS STATION IS PROVIDED WITHIN EXISTING NAVY FACILITIES AND NO SPECIFIC PROJECTS SHOULD BE PLANNED. THIS CODE IS MAINLY INTENDED FOR INVENTORY PURPOSES.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
13210	1321	S	[EA]			ANTENNA - COMMUNICATIONS	N		THIS FACILITY GROUP ENCOMPASSES RADIO ANTENNAS, SWITCHING STATIONS AND PUBLIC ADDRESS SYSTEMS. THE ANTENNAS REQUIRED ARE A FUNCTION OF THE NUMBER AND TYPE OF RADIO CIRCUITS TO BE INCORPORATED IN THE COMMUNICATIONS SYSTEM.
13250	1321	S	[EA]			P/A SYSTEM OUTDOOR	N		OUTDOOR PUBLIC ADDRESS SYSTEMS (GIANT VOICE) WILL BE PLANNED AND INSTALLED TO MEET INDIVIDUAL NEEDS OF A FACILITY
13255	1321	S	[EA]			CIRC DISP ANT ARRAY	N		THIS ANTENNA ARRAY IS GENERALLY PLANNED IN CONJUNCTION WITH A CIRCULARLY DISPOSED ANTENNA ARRAY BUILDING. SEE CATEGORY CODE 131 55 FOR ADDITIONAL GUIDANCE.

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### 133 NAV & TRAFFIC AIDS - BLDGS

Basic Category Code group 133 applies to those Air Traffic Control Facilities (ATCFs) that contain the equipment, devices, and personnel responsible for air traffic control and navigational aids. This group discusses complete air traffic control classes and systems, which are defined below. Other elements of air traffic control and navigation aids that are remotely located around the airfield can be found in the 133, 134 and 135 series of Category Codes.

13315	1331	B	[SF]			RAWIN BUILDING	Y		A RAWIN BUILDING (RADAR WIND SOUNDING) IS A SPECIALIZED WEATHER REPORTING FACILITY. IT HOUSES TRACKING EQUIPMENT USED IN CONJUNCTION WITH BALLOONBORNE RADIOSONDE TRANSMITTERS.
13320	1331	B	[SF]			VHF OMNI-DIR RNG (VOR) FAC	Y		THE VERY HIGH FREQUENCY (VHF) OMNI-DIRECTIONAL RANGE (VOR) BUILDING HOUSES A VHF, FIXED GROUND-BASED STATION WHICH CONTINUOUSLY TRANSMITS BEARING, IDENTIFICATION, AND WITH PROPER EQUIPMENT, DISTANCE INFORMATION TO PROPERLY EQUIPPED AIRCRAFT.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
13325	1331	B	[SF]			TACAN BUILDING	Y	THE TACTICAL AIR NAVIGATION (TACAN) BUILDING HOUSES UHF GROUND-BASED STATION WHICH TRANSMITS BEARING, IDENTIFICATION, AND DISTANCE INFORMATION TO PROPERLY EQUIPPED AIRCRAFT. THE TACAN IS PRIMARILY A MILITARY SHORT-RANGE 322 KM (200 MILE) NAVIGATIONAL AID THAT IS GENERALLY PLANNED FOR EACH NAVY AND MARINE CORPS AIR STATION.	
13330	1331	B	[SF]			VHF RNG TACAN FACILITY	Y	THE VERY HIGH FREQUENCY (VHF) OMNI-DIRECTIONAL RANGE/TACTICAL AIR NAVIGATION (VORTAC) BUILDING HOUSES VHF/UHF FIXED GROUND-BASED STATION THAT CONTINUOUSLY TRANSMITS BEARING, IDENTIFICATION, AND DISTANCE INFORMATION TO PROPERLY EQUIPPED AIRCRAFT WHEN DISTANCE MEASURING EQUIPMENT (DME) IS INSTALLED.	
13335	1331	B	[SF]			NDB FACILITY	Y	THIS NON-DIRECTIONAL BEACON (NDB) FACILITY IS AN UNATTENDED FACILITY WHICH HOUSES ELECTRIC EQUIPMENT (RADIO BEACON) USED TO TRANSMIT A NON-DIRECTIONAL RADIO SIGNAL PATTERN TO AIRCRAFT EQUIPPED WITH AUTOMATIC RADIO DIRECTION AND FINDING (ADF) EQUIPMENT.	
13365	1331	B	[SF]			AIR NAVIGATION BUILDING	Y	AN AIR NAVIGATION BUILDING IS A SPECIALIZED FACILITY FOR PROVIDING A READILY AVAILABLE SOURCE OF OPERATIONAL AND AERONAUTICAL INTELLIGENCE INFORMATION; STORAGE AND ISSUE OF AERONAUTICAL MAPS AND CHARTS; AND SECURE STORAGE OF CLASSIFIED MATERIAL UP TO TOP SECRET DOCUMENTS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
13371	1331	B	[SF]			RATCF FACILITY	Y	THE RADAR AIR TRAFFIC CONTROL FACILITY (RATCF) PROVIDES HOUSING FOR EQUIPMENT AND PERSONNEL TO SUPPORT INSTRUMENT FLIGHT RULES (IFR) CONTROL OF AIRCRAFT ON APPROACH TO OR DEPARTURE FROM THE TERMINAL RADAR FACILITY OR AIRPORT. OTHER FUNCTIONS INCLUDE PRECISION APPROACH RADAR (PAR) FOR LANDING AIRCRAFT DURING INCLEMENT WEATHER AND LIMITED VISIBILITY.	
13372	1331	B	[SF]			MTRACON	Y	A MILITARY TERMINAL RADAR APPROACH CONTROL (MTRACON) FACILITY IS USED TO CONTROL AIR TRAFFIC TO PROVIDE SAFE, EXPEDITIOUS, AND ORDERLY MOVEMENT OF AIRCRAFT UNDER ALL WEATHER CONDITIONS. JUSTIFICATION FOR A MTRACON IS ESTABLISHED BY THE CHIEF OF NAVAL OPERATIONS.	
13373	1331	B	[SF]			FACSFAC	Y	THE FLEET AREA CONTROL SURVEILLANCE FACILITY (FACSFAC) BUILDING HOUSES THE FACSFAC TRACKING SYSTEM (FACTS) AND NAVY TACTICAL DATA SYSTEM/ADVANCED COMBAT DIRECTION SYSTEM (NTDS/ACDS) EQUIPMENT AND PERSONNEL TO PROVIDE A VARIETY OF SERVICES TO AIR, SURFACE AND SUBSURFACE UNITS.	
13374	1331	B	[SF]			JCF FACILITY	Y	THE JOINT CONTROL FACILITY (JCF) IS AN AIR TRAFFIC CONTROL FACILITY, A RADAR AIR TRAFFIC CONTROL FACILITY (RATCF), AND A RANGE OPERATIONS CENTER (ROC) UNDER ONE ROOF.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
13375	1331	B	[SF]			AIR SURVEILLANCE RADAR FAC	Y	THE AIR SURVEILLANCE RADAR (ASR) FACILITY IS AN UNATTENDED FACILITY WHICH SERVES AS A MAJOR COMPONENT OF THE RADAR AIR TRAFFIC CONTROL FACILITY (RATCF); THE MILITARY TERMINAL APPROACH CONTROL FACILITY (MTRACON); AND THE JOINT CONTROL FACILITY (JCF). IT PROVIDES DETECTION AND IDENTIFICATION FOR CONTROL OF AIRCRAFT OPERATING IN A LINE-OF-SIGHT RANGE AND ALTITUDES DETERMINED BY SYSTEM DESIGN.
13376	1331	B	[SF]			ARSR FACILITY	Y	THE AIR ROUTE SURVEILLANCE RADAR (ARSR) FACILITY HOUSES THE ELECTRONIC LONG RANGE RADAR SYSTEM USED TO OBTAIN THE RANGE AND AZIMUTH OF AN AIRCRAFT.
13380	1331	B	[SF]			WHEELS WATCH SHELTER	Y	A PORTABLE WHEELS WATCH BOOTH IS PROVIDED WITH THE RUNWAY WHEELS-UP/WAVE-OFF LIGHTING SYSTEM, CATEGORY CODE 136 45. THE SHELTER IS LOCATED APPROXIMATELY 302 METERS (990 FEET) SHORT OF THE RUNWAY THRESHOLD NEAR THE WHEELS-UP/WAVE-OFF LIGHTING SYSTEM. THE FACILITY MAY BE EITHER A TRAILER OR TRUCK.
134						NAV & TRAFFIC AIDS - OTHER		
Basic Category Code group 134 applies to structures which function as aircraft navigation/traffic aids.								
13410	1341	S	[EA]			ANTENNA - NAVIGATION	N	AN ANTENNA SYSTEM FOR NAVIGATION AID WILL VARY WITH THE TYPE AND PURPOSE OF THE NAVIGATIONAL AID. THIS CATEGORY CODE SHALL BE USED TO INDICATE ENTIRE ANTENNA SYSTEMS.
13420	1341	S	[EA]			AP/HP BEACON	N	AN AIRPORT AND/OR HELIPORT BEACON IS AN INTERNATIONALLY RECOGNIZED ROTATING OR FLASHING ILLUMINATED BEACON OPERATED AS A VISUAL AID TO AIR NAVIGATION TO ASSIST AIRCREWS IN LOCATING AND IDENTIFYING AIRPORTS AND/OR HELIPORTS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
13440	1341	S	[EA]			GROUND CONTROL APPR SYST	Y	A GROUND CONTROL APPROACH (GCA) SYSTEM IS A RADAR APPROACH SYSTEM OPERATED FROM THE GROUND BY AIR TRAFFIC CONTROL PERSONNEL TRANSMITTING INSTRUCTIONS TO THE PILOT BY RADIO.	
13441	1341	S	[EA]			PREC APPR RADAR	Y	THE PRECISION APPROACH RADAR (PAR) IS AN UNATTENDED SELF-CONTAINED RADAR SYSTEM. THE PAR DETECTS AZIMUTH, ELEVATION, AND RANGE INFORMATION OF AIRCRAFT ON FINAL LANDING APPROACH TO PAR INSTRUMENTED RUNWAYS. THE INFORMATION IS DISPLAYED IN THE MILITARY TERMINAL RADAR APPROACH CONTROL (MTRACON) FACILITY.	
13442	1341	S	[EA]			PREC APPR LAND SYS	Y	THE PRECISION APPROACH LANDING SYSTEM (PALS) IS AN UNATTENDED, SELF-CONTAINED RADAR SYSTEM. THE PALS DETECTS AZIMUTH, ELEVATION, AND RANGE INFORMATION OF AIRCRAFT ON FINAL APPROACH TO PALS INSTRUMENTED RUNWAYS.	
13443	1341	S	[EA]			INSTR LAND SYS	Y	THE INSTRUMENT LANDING SYSTEM (ILS) PROVIDES AZIMUTH, DISTANCE, ELEVATION, AND GLIDE PATH POSITION TO AIRCRAFT ON A PRECISION APPROACH TO THE ILS INSTRUMENTED RUNWAY. THE ILS OPERATES IN THE VHF AND UHF RADIO BANDS.	
13444	1341	S	[EA]			MICROW LAND SYS	Y	THE MICROWAVE LANDING SYSTEM (MLS) PROVIDES AZIMUTH, DISTANCE, ELEVATION, AND GLIDE PATH POSITION TO AIRCRAFT ON A PRECISION APPROACH TO THE MLS INSTRUMENTED RUNWAY. THE MLS OPERATES IN A NARROW BAND MICROWAVE FREQUENCY.	



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
13445	1341	S			[EA]	SHORE AUTOM CARR LAND SYS	Y		THE SHORE-BASED AUTOMATIC CARRIER LANDING SYSTEM (ACLS) IS AN UNATTENDED, SELF-CONTAINED RADAR SYSTEM. THE ACLS CONSISTS OF PRECISION TRACKING RADAR COUPLED TO A COMPUTER DATA LINK TO PROVIDE CONTINUOUS INFORMATION TO THE AIRCRAFT, MONITORING CAPABILITY TO THE PILOT, AND A BACKUP APPROACH SYSTEM.
13450	1341	S			[EA]	OBSTRUCTION LTG / MARKINGS	N		OBSTRUCTION LIGHTING PROVIDES VISUAL IDENTIFICATION OF OBJECTS AT NIGHT, OR IN SOME CASES IN DAY TIMES, THAT ARE POTENTIALLY HAZARDOUS TO AIR NAVIGATION.
13455	1341	S			[EA]	VISUAL APPR SLOPE INDICTR	N		THE VISUAL APPROACH SLOPE INDICATOR (VASI) SYSTEM IS AN UNATTENDED SYSTEM THAT PROVIDES VISUAL GLIDE SLOPE GUIDANCE TO PILOTS OF AIRCRAFT DURING THE FINAL LANDING APPROACH. THE VASI IS HELPFUL DURING DAY AND NIGHT OPERATIONS AND FOR VISUAL FLIGHT RULES (VFR) AND INSTRUMENT FLIGHT RULES (IFR) OPERATIONS.
13456	1341	S			[EA]	PREC APPR PATH IND SYS	Y		THE PRECISION APPROACH PATH INDICATOR (PAPI) SYSTEM IS AN UNATTENDED SYSTEM WHICH PROVIDES VISUAL GLIDE SLOPE GUIDANCE TO PILOTS OF AIRCRAFT DURING THE FINAL LANDING APPROACH. THE PAPI SYSTEM PROVIDES THIS INFORMATION DURING THE DAY AND NIGHT FOR VISUAL FLIGHT RULES (VFR) AND INSTRUMENT FLIGHT RULES (IFR) OPERATIONS AS LOW AS CATEGORY I CONDITIONS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
13460	1341	S	[EA]			OPT LANDING AIDS	N	OPTICAL LANDING AIDS PROVIDE THE PILOT APPROACHING FOR A LANDING WITH A VISUAL SIGNAL TO ASSIST IN INTERCEPTING AND MAINTAINING THE CORRECT APPROACH GLIDE SLOPE. THE OLA IS A REQUIRED VISUAL AID FOR LANDINGS ON AIRCRAFT CARRIERS, BUT ON SHORE-BASED AIRFIELDS THE OLA IS PRIMARILY AN AID FOR TRAINING OR PRACTICE. THE OLA MAY BE USED DURING DAY OR NIGHT OPERATIONS AND IN ALL WEATHER CONDITIONS.
13462	1341	S	[EA]			WIND DIRECTION INDICATOR	N	A WIND DIRECTION INDICATOR PROVIDES VISUAL INFORMATION OF THE SURFACE WIND DIRECTION AND GENERAL INDICATION OF THE WIND SPEED TO THE AIRCREW. THIS WIND INFORMATION IS MOST USEFUL DURING TAKEOFF, FOR ORIENTATION TO MAKE AN APPROACH, AND IN THE FINAL PHASE OF APPROACH PRIOR TO TOUCHDOWN.
13464	1341	S	[EA]			RUNWAY DISTANCE MARKERS	N	THE PURPOSE OF RUNWAY DISTANCE MARKERS IS TO INDICATE TO AIRCREWS THE DISTANCE REMAINING TO THE END OF THE RUNWAY DURING TAKEOFF AND LANDING. THE RDM PROVIDE THIS INFORMATION FOR DAY AND NIGHT OPERATIONS IN ALL WEATHER CONDITIONS. THE RDM SHOULD BE PROVIDED FOR ALL RUNWAYS WHERE FIXED WING JET AIRCRAFT OPS ARE CONDUCTED AND ARE RECOMMENDED FOR RUNWAYS INTENDED FOR OPS OF PROPELLER TYPE AIRCRAFT.
13466	1341	S	[EA]			VOR/TACAN CHK SIGN	N	A VOR/TACAN CHECK SIGN PROVIDES INFORMATION FOR THE PILOT WHEN VERIFYING THE OPERATION OF THE NAVIGATIONAL AID IN THE AIRCRAFT BEFORE TAKING OFF. THIS CHECK SIGN IS A VISUAL IDENTIFICATION MARKER ERECTED IN THE AREA ADJACENT TO THE AIRCRAFT HOLDING POINT AT THE TAXIWAY ACCESS TO RUNWAY ENDS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
13470	1341	S	[EA]			RADAR TOWER	N	RADAR TOWERS ARE TOWERS HOSTING VARIOUS RADAR SYSTEMS AND MUST BE PLANNED ON AN INDIVIDUAL BASIS.	
13471	1341	S	[EA]			AVIATION METEOROLOGICAL FAC	N	WEATHER FORECASTING FACILITY THAT SUPPORTS AIR OPERATIONS.	
135						COMM & CONTROL LINES			
Communication lines provide circuits between the various activities on or off the station.									
13510	1351	LS	[MI]			COMM LINES EXCL TELEPHONE	N	COMMUNICATION LINES PROVIDE CIRCUITS BETWEEN THE VARIOUS ACTIVITIES ON OR OFF THE STATION. THE COMMUNICATIONS NET MAY INCLUDE TRUNK LINE SERVICE CABLE, FEEDER LINES, AND DIRECT CIRCUITS DEPENDING ON THE COMPLEXITY OF THE SYSTEM.	
13520	1351	LS	[MI]			TELEPHONE LINES	N	COMMUNICATION LINES, TO INCLUDE OVERHEAD, UNDERGROUND, AND MARINE CABLES AND LINES.	
136						AIRFIELD PAVEMENT LIGHTING			
Airfield pavement lighting includes facilities for lighting all airfield pavements and approaches including airfield Visual Landing Aids for approaches, landings, takeoffs, taxiing, and surface maneuvering of aircraft on Navy and Marine Corps airfields. The visual landing aids include lighting and markings.									
13610	1361	S	[LF]			APPROACH LIGHTING	N	APPROACH LIGHTING ENHANCES THE AIRCREW'S ABILITY TO ACQUIRE THE RUNWAY ENVIRONMENT VISUALLY WHEN MAKING AN APPROACH FOR LANDING DURING PERIODS OF REDUCED VISIBILITY. VISUAL CUES FOR DIRECTIONAL AND ROLL GUIDANCE ARE PROVIDED TO THE AIRCREW FOR OPERATIONS AT NIGHT AND IN MARGINAL WEATHER CONDITIONS BY DAY. THE SYSTEM INCLUDES BOTH APPROACH LIGHTS AND SEQUENCED FLASHERS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
13620	1361	S	[LF]			APRON & PKG APRN LIGHTING	N	APRON AND PARKING AREA LIGHTING ENABLES THE AIRCREW TO GUIDE THEIR AIRCRAFT INTO POSITION FOR LOADING, SERVICING, OR PARKING AND PROVIDES ILLUMINATION TO PERFORM SUCH FUNCTIONS AS FUELING, MAINTENANCE, LOADING, UNLOADING, AND SECURITY.	
13630	1361	S	[LF]			RUNWAY EDGE LIGHTING	N	THIS CATEGORY CODE INCLUDES TWO GROUPS OF LIGHTS, RUNWAY EDGE LIGHTS, WHICH DEFINE THE LATERAL LIMITS OF THE PAVEMENT, AND CIRCLING GUIDANCE LIGHTS (CGLS), WHICH ENABLE AN AIRBORNE AIRCREW TO LOCATE THE RUNWAY WHILE OFF TO THE SIDE OF THE RUNWAY, AND ESTABLISH THE PROPER TRAFFIC PATTERN.	
13635	1361	S	[LF]			RUNWAY CENTERLINE LIGHTING	N	RUNWAY CENTERLINE LIGHTING PROVIDES VISUAL AID TO ASSIST THE AIRCREW IN KEEPING THE AIRCRAFT CENTERED ON THE RUNWAY DURING TAKE-OFF AND AFTER LANDING AT NIGHT OR IN CONDITION OF REDUCED VISIBILITY. IT IS A SUPPLEMENT TO RUNWAY EDGE LIGHTING AND MARKINGS AND CIRCLING GUIDANCE LIGHTING, CATEGORY CODE 136 30.	
13636	1362	S	[EA]			SIMULATE CARRIER DECK LTG	Y	A SIMULATED CARRIER DECK IS USED TO TRAIN PILOTS ASHORE FOR LANDING AIRCRAFT UNDER SIMULATED CONDITIONS OF A CARRIER AT SEA. SIMULATED CARRIER DECK LIGHTING AND MARKINGS PERMITS TRAINING DURING THE DAY, NIGHT, AND ADVERSE VISIBILITY CONDITIONS.	
13645	1362	S	[EA]			WHEELS UP / WAVE OFF LTG	N	WHEELS-UP AND WAVE-OFF LIGHTS ARE PROVIDED TO ALLOW EITHER THE WHEEL WATCH, THE LANDING SIGNAL OFFICER (LSO), OR CONTROL TOWER PERSONNEL TO DETERMINE IF A LANDING AIRCRAFT HAS ITS LANDING GEAR FULLY EXTENDED AND/OR TO SIGNAL TO AN AIRCREW TO ABORT OR ¿WAVE-OFF¿ A LANDING ATTEMPT.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
13650	1361	S	[LF]			TAXIWAY LIGHTING	N		TAXIWAY LIGHTING AND MARKINGS DEFINE THE LATERAL LIMITS AND DIRECTION OF A TAXIWAY, CATEGORY CODE 112-10, TO GUIDE AIRCRAFT MOVEMENT BETWEEN THE RUNWAY OPERATIONAL AREA AND THE AIRCRAFT PARKING AREA DURING NIGHT OPERATIONS OR CONDITIONS OF POOR VISIBILITY.
13655	1362	S	[EA]			TOUCHDOWN ZONE LIGHTING	N		TOUCHDOWN ZONE LIGHTING DELINEATES THE TOUCHDOWN ZONE AND PROVIDES DIRECTIONAL AND ROLL GUIDANCE FOR AIRCRAFT APPROACHING THE THRESHOLD. IT PROVIDES VISUAL CUES FOR MORE ACCURATELY CENTERING THE AIRCRAFT ON THE RUNWAY, ADJUSTING ATTITUDE FOR TOUCHDOWN, AND DETERMINING THE TOUCHDOWN POSITION. THE LIGHTING CONSISTS OF BARS OF WHITE LIGHTS IN THE PAVEMENT ON EACH SIDE OF THE RUNWAY CENTERLINE.
13660	1362	S	[EA]			THRESHOLD LIGHTING	N		THRESHOLD LIGHTING IS A SYSTEM OF LIGHTS DEFINING THE ENDS OF THE USABLE RUNWAY SURFACE. THEY INCLUDE THRESHOLD LIGHTS, DISPLACED THRESHOLD LIGHTS, RUNWAY END IDENTIFICATION LIGHTS (REIL) AND RUNWAY END LIGHTS. THE THRESHOLD LIGHTS ARE DISPLACED FROM THE EXTREMITY OF THE RUNWAY WHEN A PORTION IS UNAVAILABLE FOR NORMAL OPERATIONS
13665	1361	S	[LF]			HELIPORT LIGHTING	N		HELIPORT LIGHTING IS A SYSTEM OF LIGHTS ARRANGED TO CLEARLY DEFINE THE HELICOPTER LANDING PAD FOR OPERATIONS AT NIGHT AND DURING PERIODS OF POOR VISIBILITY. HELIPORT LIGHTING INCLUDES ALL VISUAL REFERENCE ASPECTS OF THE APPROACH AND LANDING OF ROTARY WING AIRCRAFT. THIS INCLUDES VISUAL AIDS, MARKINGS, PERIMETER AND APPROACH LIGHTS, AND RUNWAY AND TAXIWAY LIGHTS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
137						SHIP NAV&TRAFFIC AIDS-BLDG			
This code group applies to buildings for housing sea traffic control, navigation aids and navigation services.									
13720	1371	B	[SF]	CP		LIGHTHOUSE	Y		A LIGHTHOUSE IS A BUILDING THAT HOUSES A NAVIGATION BEACON THAT MAY EMIT LIGHT, SOUND, RADIO, RADAR, OR A COMBINATION THEREOF. IT MAY BE ONSHORE OR OFFSHORE. CONSTRUCTION IS DONE OVERSEAS WHEN APPROPRIATE BY THE NAVAL FACILITIES ENGINEERING COMMAND.
138						SHIP NAV&TRAFFIC AIDS-OTHR			
This code group applies to structures which function as sea traffic navigation/traffic aids.									
13810	1381	S		[EA]		BEACON-SHIP	N		THE U.S. COAST GUARD HAS SPECIFIC JURISDICTION OVER ALL AIDS TO NAVIGATION (DAY BEACONS, BUOYS, FOGHORNS, ETC.,) IN THE CONTINENTAL UNITED STATES AND IN ALL OUTLYING TERRITORIES AND POSSESSIONS. DAY BEACONS ARE UNLIGHTED STRUCTURES USED TO MARK ISOLATED DANGERS OR CHANNELS, EDGES, OR ALIGNMENT.
13820	1381	S		[EA]		NAVIGATION AID TARGET	N		THIS CATEGORY CODE IS TO BE USED FOR NAVIGATIONAL AID TARGETS WHICH ARE A PART OF MARITIME NAVIGATIONAL AIDS.
13825	1381	S		[EA]		ANTENNA- NAVIGATION	N		THIS CATEGORY CODE IS TO BE USED FOR ANTENNAS OR ANTENNA SYSTEMS WHICH ARE A PART OF MARITIME NAVIGATIONAL AIDS.
140						LAND OPERATIONAL FACILITYS			
141						OPERATIONAL - BUILDINGS			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
All buildings, which are non-ship related, used for housing operational types of activities and equipment									
14111	1412	B	[SF]			AIR PASSENGER TERMINAL	Y		THE AIR PASSENGER TERMINAL PROVIDES FACILITIES FOR PROCESSING AUTHORIZED PASSENGERS AND THEIR BAGGAGE AND FOR PROCESSING INCIDENTAL FREIGHT. SPACE IS PROVIDED IN THE TERMINAL FOR THE FOLLOWING FUNCTIONAL AREAS: ADMINISTRATIVE SPACE, BAGGAGE CLAIM ROOM, CHECK-IN COUNTER, MINOR FREIGHT STORAGE, INFORMATION COUNTER, AND WAITING LOUNGE WITH FOOD CONCESSIONS.
14112	1412	B	[SF]			AIR CARGO TERMINAL	Y		AN AIR CARGO TERMINAL IS PLANNED FOR AIR STATIONS WHERE CARGO AND FREIGHT HANDLING EXCEEDS 10,000 POUNDS PER DAY. THE AIR CARGO TERMINAL IS SEPARATE FROM THE AIR PASSENGER TERMINAL WHERE ONLY INCIDENTAL FREIGHT IS HANDLED. AIR CARGO TERMINAL FUNCTIONS INCLUDE RECEIPT OF PACKAGES, CONTROL DOCUMENTATION, PALLETIZATION, HOLDING FOR SHIPMENT, AIRCRAFT LOADING AND UNLOADING.
14113	1412	B	[SF]			COURIER STATION	Y		THIS FACILITY IS USED TO STORE AND DISSEMINATE CLASSIFIED MATERIAL FOR MISSION PLANNING, PILOT TRAINING AND BRIEFINGS IN SUPPORT OF ATTACK AIRCRAFT OPERATIONS.
14120	1411	B	[SF]			ACFT FIRE AND RESCUE STA	Y		THE AIRCRAFT FIRE AND RESCUE STATION PROVIDES FIRE AND EMERGENCY RESCUE PROTECTION FOR PILOTS AND AIRCRAFT. WHEN FEASIBLE, THE AIRCRAFT FIRE AND RESCUE STATION IS COMBINED WITH THE STRUCTURAL FIRE STATION (CATEGORY CODE 730 10) TO FORM ONE COMPLETE EMERGENCY FACILITY, CATEGORY CODE 141 25, COMBINED STRUCTURAL/ AIRCRAFT FIRE/RESCUE STATION.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
14125	1411	B	[SF]			COMBINED FIRE/RESCUE STA	Y	A COMBINED STRUCTURAL/AIRCRAFT FIRE/RESCUE STATION IS PLANNED UNDER CERTAIN CONDITIONS TO SERVE THE FUNCTION OF A STRUCTURAL FIRE STATION (CATEGORY CODE 730 10) AND AN AIRCRAFT FIRE AND RESCUE STATIONS. FIRE AND RESCUE STATION. THE COMBINED FACILITY IS PLANNED FOR A LOCATION THAT SATISFIES THE RESPONSE TIME AND DISTANCE REQUIREMENTS FOR BOTH THE STRUCTURAL FIRE AND THE AIRCRAFT FIRE.
14130	1412	B	[SF]			ACFT LINE OPERATIONS BLDG	Y	THE AIRCRAFT LINE OPERATIONS BUILDING IS USED TO CENTRALIZE GROUND OPERATIONS OF THE FLIGHT LINE. THE BUILDING IS UTILIZED IN KEEPING OF SQUADRON DAILY FLIGHT BOOKS, AIRCRAFT STATUS BOARDS, AND BULLETIN BOARDS AND AS SUPPORT FOR LINE OPERATIONS PERSONNEL BY PROVIDING SHELTER, A WATER COOLER, AND A CHEMICAL TOILET.
14140	1412	B	[SF]			ACFT OPS BLDG *EXC 141-70*	Y	AN AIRCRAFT OPERATIONS BUILDING IS PLANNED FOR ALL NAVY AIR STATIONS, AUXILIARY AIR STATIONS, AND AIR FACILITIES. THE BUILDING HOUSES THE ADMINISTRATION OF FLIGHT OPERATIONAL ACTIVITIES WITH ALL SUPPORTING FUNCTIONS INCLUDING FLIGHT CONTROL, COMMUNICATIONS, AND WEATHER SERVICES.
14141	1412	B	[SF]			MATCU OPERATIONS BUILDING	Y	THE MATCU PERFORMS A COMBINED FUNCTION SIMILAR TO THAT ACCOMPLISHED WITH GROUND CONTROL APPROACH (GCA) SYSTEM; TACAN BUILDING; AND, AIR SURVEILLANCE RADAR (ASR) BUILDING. DEPENDING ON THE LEVEL OF AIRCRAFT OPERATIONS, THE MATCU OPERATIONS BUILDING MAY PROVIDE THE SOLE GCA SUPPORT AT AN AIR INSTALLATION OR MAY SUPPLEMENT AND BE IN ADDITION TO PERMANENT ASR, TACAN, AND GCA FACILITIES



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
14142	1444	B	[SF]			AIR INTELLIGENCE SUPPT CTR	Y	THIS FACILITY IS USED TO STORE AND DISSEMINATE CLASSIFIED MATERIAL FOR MISSION PLANNING, PILOT TRAINING AND BRIEFINGS IN SUPPORT OF ATTACK AIRCRAFT OPERATIONS.	
14160	1441	B	[SF]			VISUAL INFORMATION FAC	Y	A PHOTOGRAPHIC BUILDING IS PLANNED TO SUPPORT THE PHOTOGRAPHIC MISSION OF AN ACTIVITY. IT PROVIDES THE LABORATORY COMPLETE WITH EQUIPMENT AND STORAGE THAT APPLIES TO THE SPECIFIC MISSION.	
14165	1441	B	[SF]			FLEET RECON PHOTO LAB	Y	A FLEET RECONNAISSANCE PHOTOGRAPHIC LABORATORY IS PLANNED ONLY WHERE THE STATION SUPPORTS THE MISSION OF PHOTOGRAPHIC RECONNAISSANCE SQUADRONS AND THERE IS NO PHOTOGRAPHIC BUILDING (CATEGORY CODE 141 60) TO PROVIDE THE SUPPORT.	
14170	1413	B	[SF]			CONTROL TWR ATTD/FREE STD	Y	A CONTROL TOWER PROVIDES SPACE FOR EQUIPMENT AND PERSONNEL TO CONTROL AIRCRAFT TRAFFIC. IT IS AN ELEVATED BUILDING HAVING AN UNOBSTRUCTED LINE-OF SIGHT TO THE AIRFIELD APPROACH AREAS, RUNWAYS, TAXIWAYS, AIRCRAFT PARKING AREAS, AND ALL OTHER AREAS OVER WHICH AIRCRAFT MOVEMENTS MUST BE CONTROLLED.	
14181	1412	B	[SF]			GCA CREW FACILITY	Y	THE GROUND CONTROL APPROACH (GCA) CREW FACILITY PROVIDES A READY ROOM FOR ON DUTY PERSONNEL ASSIGNED TO THE GCA VAN. THE FACILITY CONSISTS OF TWO (2) STANDARD DESIGN SKID-MOUNTED SHELTERS (EACH 12 FEET BY 20 FEET). THE CREW FACILITY IS AUTHORIZED WHENEVER THE MOBILE GCA UNIT IS FURNISHED.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
14182	1412	B	[SF]			FULL PRESSURE SUIT FAC	Y	PRESSURE SUIT MAINTENANCE PERFORMED UNDER THIS CATCODE, NORMALLY IN THE PARACHUTE AND SURVIVAL EQUIPMENT SHOP (CATEGORY CODE 211 34). SPECIAL JUSTIFICATION IS REQUIRED TO PROVIDE A SEPARATE FACILITY FOR THIS PURPOSE.	
14187	4122	B	[SF]	GA		LIQUID OXY/NIT FAC(NONIND)	Y	A LIQUID OXYGEN/NITROGEN FACILITY IS REQUIRED AT EACH NAVY AND MARINE CORPS AIR STATION WHERE 50 OR MORE ATTACK AND FIGHTER-TYPE AIRCRAFT ARE ASSIGNED. THE FACILITY PROVIDES FOR STORAGE, VAPORIZATION, AND TRANSFER OF NON- INDUSTRIAL OXYGEN AND NITROGEN AND FOR TEST AND REPAIR OF CRYOGENIC EQUIPMENT ASSOCIATED WITH AVIATOR AND AIRCRAFT SUPPORT.	
14188	1465	S	[SF]			HARDENED AIRCRAFT SHELTER	Y	A REINFORCED HANGAR OR SHELTER USED TO PROTECT AIRCRAFT FROM ATTACK AND OFTEN USED IN FORWARD DEPLOYED LOCATIONS.	
142						OPERTNL HELIUM PLANTS&STRG		Facilities for receipt, storage, processing and reprocessing helium gas. Includes tanks, pipes, valves, valve chambers, and similar equipment and facilities.	
14210	1421	B	[SF]			HELIUM PROCESSING PLANT	Y	A BUILDING FOR THE RECEIPT, BULK STORAGE, PROCESSING, AND DISPENSING OF HELIUM GAS. INCLUDED ARE TANKS, VALVES, VALVE CHAMBERS, AND SIMILAR EQUIPMENT.	
14219	1421	B	[SF]			HELIUM STORAGE BUILDING	Y	A BUILDING FOR THE STORAGE OF BULK HELIUM GAS.	
14220	1422	S		[EA]		HELIUM STORAGE FACILITY	Y	A FACILITY, OTHER THAN A BUILDING, FOR THE BULK STORAGE OF HELIUM GAS.	
143						SHIP & OTHER OPERTNL-BLDGS			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
All buildings, which are ship related, used for housing operational types of activities and equipment									
14309	1444	B	[SF]			EXP OPS SUP FAC	Y		AN EXPEDITIONARY OPERATIONS SUPPORT MODULE (EOSM) PROVIDES SPACES FOR THE FOLLOWING: ADMIN, MEDICAL, MISSION PLANNING CELL (MAY OR MAY NOT BE PART OF SCIF), TRAINING CLASSROOMS, ARMORY, STORAGE, AND LOCKER AND SHOWER SPACES.
14310	5307	B	[SF]			EMERGENCY VEHICLE GARAGE	Y		THIS IS A SHELTER FOR OFFICIAL EMERGENCY AND ALERT VEHICLES, SUCH AS AN AMBULANCE. IT IS JUSTIFIED IN INSTANCES WHEN IMMEDIATE RESPONSE REQUIRED BY SPECIAL WATERFRONT OPERATIONAL VEHICLE.
14311	1444	B	[SF]			OPERATIONAL VEHICLE GARAGE	Y		AN OPERATIONAL VEHICLE GARAGE IS USED FOR THE STORAGE OF VEHICLES WHICH ARE NOT UTILIZED ON A DAILY BASIS AND WHICH ARE EXPOSED TO ADVERSE WEATHER CONDITIONS THAT WOULD HAVE A DETRIMENTAL EFFECT UPON THEM IF STORED OUT IN THE OPEN. ACCORDINGLY, THE TYPE OF VEHICLE STORED, FREQUENCY OF USE AND CLIMATIC CONDITIONS, WILL DETERMINE WHETHER THIS TYPE OF FACILITY IS WARRANTED.
14312	8523	LS	[SY]			OPRTNL VEHICLE LAYDWN AREA	Y		AN OPERATIONAL VEHICLE PARKING AND/OR LAYDOWN AREA CONSISTS OF AN ASPHALT OR CONCRETE PAVED AREA LARGE ENOUGH TO STORE AND PROVIDE CIRCULATION FOR THE VEHICLES AND EQUIPMENT FOR WHICH THE COMMAND IS RESPONSIBLE.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
14315	1731	B	[SF]			RANGE OPERATIONS CENTER	Y	A RANGE OPERATIONS CENTER IS THE CONTROL POINT FOR TESTING TORPEDOES, CALIBRATING SHIPS, FIRING SYSTEMS, AND TRAINING PILOTS AND TESTING AIRCRAFT ON GUNNERY AND BOMBING RANGES. THE CENTER WILL VARY WITH THE EQUIPMENT AND CONTROL AREAS REQUIRED. STANDARD PLANNING FACTORS FOR A CENTER ARE NOT AVAILABLE. ITS SIZE MUST BE PLANNED TO SUPPORT THE EQUIPMENT AND CONTROL AREAS TO BE HOUSED.	
14317	1444	B	[SF]			SPACE SURVEILLANCE FACILITY	Y	FACILITIES TYPICALLY SUPPORT GLOBAL SPACE SURVEILLANCE NETWORK WHICH DETECTS, TRACKS, IDENTIFIES, AND CATALOGS MAN-MADE OBJECTS IN SPACE AND PROVIDES POSITION INFORMATION ON THESE OBJECTS. REQUIREMENTS ARE DETERMINED BY NAVAL NETWORK AND SPACE OPERATIONS COMMAND.	
14320	1444	B	[SF]			ORDNANCE OPERATIONS BLDG	Y	AN ORDNANCE OPERATIONS BUILDING IS AUTHORIZED WHERE THERE IS A NEED TO CONTROL AN ORDNANCE OPERATION. ORDNANCE OPERATIONS ARE THOSE INVOLVING AMMUNITION STORAGE, HANDLING OR DISPOSAL AND ORGANIZATIONAL LEVEL MAINTENANCE. THE FACILITIES WHOSE PRIMARY FUNCTION IS ORDNANCE MAINTENANCE, INTERMEDIATE LEVEL AND ABOVE, ARE ADDRESSED IN THE 200 SERIES CATEGORY CODES.	
14321	1443	B	[SF]			AMMUNITION SEGREGATION FAC	Y	A SEGREGATION FACILITY IS A BUILDING OR SERIES OF BUILDINGS WHERE FLEET RETURN EXPLOSIVE AND INERT MATERIAL ARE SCREENED AND GROUPED BY TYPE AND PHYSICAL CONDITION.	
14322	1444	B	[SF]			NAVY EOD SHORE DET	Y	THIS FACILITY PROVIDES SUPPORT FOR EOD SHORE DETACHMENTS PERMANENTLY ASSIGNED TO NAVY INSTALLATIONS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG IND.	DESCRIPTION
			AREA	OTHER	ALT			
14323	1444	B	[SF]			NAVY EODMU	Y	A FACILITY THAT SUPPORTS EXPLOSIVE ORDNANCE DISPOSAL MOBILE UNITS. EODMUS ARE RESPONSIBLE FOR MANNING, EQUIPPING AND TRAINING OF ANY NUMBER OF DEPLOYABLE EOD DETACHMENTS: MOBILE DETACHMENTS, AREA SEARCH DETACHMENTS, ORDNANCE CLEARANCE DETACHMENTS, MOBILE COMMUNICATIONS DETACHMENTS, COMBAT SERVICE SUPPORT DETACHMENTS, FLY AWAY RECOMPRESSION CHAMBER DETACHMENTS, MINE COUNTER MEASURES DETACHMENTS
14324	1444	B	[SF]			MARINE CORPS EOD FAC	Y	THESE FACILITIES PROVIDE SUPPORT FOR MARINE CORPS EOD SHORE TEAMS AND PLATOONS PERMANENTLY ASSIGNED TO MARINE CORPS INSTALLATIONS. THE MANNING STRUCTURE FOR EOD TEAMS AND PLATOONS HAS INCREASED AND IS REFLECTED BELOW IN CATEGORY CODES 143 24 AND 143 26.
14325	1444	B	[SF]			SEAL TEAM BUILDING	Y	THIS FACILITY IS FOR THE SUPPORT OF SEAL TEAMS. THE REQUIREMENTS FOR THESE FACILITIES ARE DEVELOPED BY AN INDUSTRIAL ANALYSIS FOR THE SPECIFIC FACILITY. SEE CATEGORY CODE 610 10 FOR ADMINISTRATIVE SPACE GUIDELINES AND CATEGORY CODE 159 64 FOR WATERFRONT OPERATIONS BUILDING GUIDELINES.
14326	1444	B	[SF]			MARINE CORPS EOD PLATOON	Y	THIS FACILITY IS RESPONSIBLE FOR MANNING, EQUIPPING, AND TRAINING FOR EOD OPERATIONS IN SUPPORT OF FLEET MARINE FORCES.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
14335	1444	B	[SF]			REGISTERED PUB ISSUE OFF	Y	A REGISTERED PUBLICATIONS ISSUING OFFICE (RPIO) HAS A PRIMARY MISSION OF SUPPORTING COMMUNICATIONS OPERATIONS OF THE FLEET, NAVAL AVIATION, U.S. MARINE CORPS, AND THE U.S. COAST GUARD. RPIO'S RECEIVE, STORE, ISSUE, ACCOUNT FOR, AND OFFICIATE DURING THE DESTRUCTION OF HIGHLY CLASSIFIED CRYPTOLOGICAL PUBLICATIONS, EQUIPMENT, AND DEVICES CIRCULATING IN THE REGISTERED PUBLICATIONS SYSTEM (RPS).	
14341	1431	B	[SF]			AMPHIBIOUS OPERATIONS BLDG	Y	ORGANIZATIONAL FACILITY FOR EXPEDITIONARY AMPHIBIOUS OPERATIONS.	
14345	4427	B	[SF]			ARMORY	Y	A NAVY INSTALLATION ARMORY PROVIDES SPACE FOR STORAGE AND ROUTINE MAINTENANCE OF SMALL ARMS AND EMERGENCY GEAR. THE MATERIALS STORED WILL PROVIDE FOR EMERGENCIES AND FOR TRAINING OF SELECTED PERSONNEL IN THE HANDLING OF STATION EMERGENCIES, CIVIL DISORDERS, AND AREA DISASTERS.	
14346	1446	B	[SF]			MARINE BRKS-GEN PURP BLDG	Y	THE CRITERIA CONTAINED HEREIN ARE APPLICABLE TO CNO COMMANDED MARINE BARRACKS. THE PURPOSE OF THE MARINE BARRACKS IS TO PROVIDE SUCH SECURITY AS APPROVED BY THE CHIEF OF NAVAL OPERATIONS, IN COORDINATION WITH THE COMMANDANT OF THE MARINE CORPS, AND TO PERFORM SUCH ADDITIONAL FUNCTIONS AS DIRECTED BY CMC.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
14347	1446	B	[SF]			ALERT FORCE BUILDING	Y	AN ALERT FORCE BUILDING IS PROGRAMMED IN CONJUNCTION WITH AN AIR/UNDERWATER WEAPONS SHOP, WHEN REQUIRED TO MEET THE ALERT FORCE RESPONSE TIMES ESTABLISHED FOR THE SHOP. THE ALERT FORCE BUILDING BARRACKS FACILITIES, INCLUDING LIMITED FACILITIES NECESSARY TO SUPPORT THE GUARD OF THE DAY FOR AN AUW SHOP. IT ALSO CONTAINS A DUTY OFFICE, PROVISION FOR WEAPONS STORAGE AND AN ALARM REPEATER PANEL.
14355	1444	B	[SF]			TRANSIT SHED	Y	A TRANSIT SHED IS PLANNED TO SUPPORT THE RAPID AND ORDERLY TRANSFER OF TRUCK AND RAIL FREIGHT IN SHIPMENT FROM ONE CARRIER TO ANOTHER WITH MINIMUM STORAGE. FOR A WATERFRONT TRANSIT SHED, SEE CATEGORY CODE 156 10. THE TRANSIT SHED IS OF THE MINIMUM DESIGN THAT WILL PROTECT THE FREIGHT FROM THE WEATHER AND PROVIDE ANY SECURITY NECESSARY.
14360	1431	B	[SF]			EXPLOSIVES SHIP/TRAN DEP	Y	AN EXPLOSIVES TRANSFER DEPOT IS A FACILITY USED TO TRANSFER BREAK-BULK AMMUNITION AND EXPLOSIVES BETWEEN AUTOMOTIVE VEHICLES AND RAILCARS FOR FURTHER SHIPMENT, OR FOR DELIVERY TO A STORAGE MAGAZINE, LOADING BUILDING, WATERFRONT OR AIRFIELD.
14365	1431	B	[SF]			REG/INST EMER OPS CTR	Y	A REGION/INSTALLATION EMERGENCY OPERATIONS FACILITY IS A SHORE MISSION SPECIFIC COMMAND, CONTROL, AND COORDINATION (C3) AREA IN DIRECT SUPPORT OF THE OPERATIONAL MISSION OF A REGION/INSTALLATION NAVY OR MARINE CORPS ACTIVITY. THIS FACILITY CAN ALSO BE DESIGNATED AS A REGIONAL OPERATIONS CENTER (ROC), EMERGENCY CONTROL CENTER (ECC), OR EMERGENCY ACTION CENTER (EAC).

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG IND.	DESCRIPTION
			AREA	OTHER	ALT			
14370	1442	B	[SF]			RADIATN INST CALIBRTN FAC	Y	A HEALTH PHYSICS CALIBRATION BUILDING CONTAINS FACILITIES REQUIRED FOR CALIBRATION OF HEALTH PHYSICS SURVEY INSTRUMENTS AND AREA MONITORING DEVICES. THESE DEVICES ARE USED TO PROTECT PERSONNEL AGAINST IONIZING RADIATION FROM X-RAYS AND ATOMIC PARTICLES.
14375	1442	B	[SF]			POL OPN/SAMPLING/TEST BLDG	Y	THE POL OPERATION BUILDING PROVIDES SPACE REQUIRED FOR QUALITY CONTROL AND ADMINISTRATION OF FUEL ACTIVITY. SPACE IS PROVIDED IN THE BUILDING FOR AN ADMINISTRATIVE OFFICE, CONTROL/GAUGE MONITORING CENTER, AND FUELS TESTING LABORATORY. PHYSICAL OPERATION AND CONTROL OF THE FUEL SYSTEM WILL BE ACCOMPLISHED ELSEWHERE (SUCH AS THE PUMP HOUSE).
14377	1443	B	[SF]			OPERATIONAL STORAGE	Y	OPERATIONAL STORAGE SUPPORTS MULTIPLE DEPARTMENTS/DIVISIONS WITHIN A COMMAND. IT IS UNDER THE CONTROL OF THE LOGISTICS AND SUPPLY DEPARTMENT. THIS CATEGORY CODE IS USED TO IDENTIFY AREAS USED FOR BULK STORAGE AREAS OF MAJOR END ITEMS, AND OPERATIONAL MATERIAL.
14378	1443	B	[SF]			OP HAZARD/FLAMMABLE STRGE	Y	THIS CATEGORY WILL BE USED TO PROVIDE A FACILITY FOR THE STORAGE OF MATERIALS USED IN DAILY OPERATIONS THAT REQUIRE SPECIAL ENVIRONMENTAL SEPARATION. THESE MATERIALS SUCH AS PAINT, ACETONE, OIL, ETC. ARE CONSIDERED TO BE HAZARDOUS AND/OR FLAMMABLE.



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG IND.	DESCRIPTION
			AREA	OTHER	ALT			
14380	1404	B	[SF]			MISSION OPS COMM/CONTR FAC	Y	A MISSION OPERATION COMMAND AND CONTROL FACILITY IS A SPECIALIZED FACILITY THAT IS ONLY REQUIRED IN SELECT LOCATIONS TO SUPPORT THE OPERATIONS OF FORCE COMMANDERS AND FLEET COMMANDERS (E.G. US FLEET FORCES COMMANDER, PACIFIC FLEET) AND SELECTED OTHERS AS ESTABLISHED BY DOD. A MISSION OPERATION COMMAND AND CONTROL FACILITY MAY ALSO CONTAIN FACILITY REQUIREMENTS FOR TYPE COMMANDS (E.G. AIRLANT, SUBPAC), OPERATIONAL SUPPORT COMMANDS (E.G. CTF AND CTG) AND A MARITIME OPERATIONS CENTER (MOC).
14385	1311	B	[SF]			JOINT RESERVE INTEL CENTER	Y	JOINT RESERVE INTELLIGENCE CENTER (JRIC). A JRIC IS A JOINT INTELLIGENCE PRODUCTION AND TRAINING ACTIVITY THAT USES INFORMATION NETWORKS TO LINK RESERVIST INTELLIGENCE PERSONNEL, ACTIVE DUTY UNITS AND CONTRACTORS WITH THE COMBATANT COMMANDS, SERVICES, AND/OR COMBAT SUPPORT AGENCIES.
144								
145								
146								
148						SHIP OPRTNL FAC- OTHER		
<p>This category group contains facilities and structures which support tactical or organizational ship and other land operations in which do not fall readily into another category. For facilities supporting aircraft operations, use category group 149.</p>								
14810	1481	S	[EA]			NUCLEAR PROPULSN SUPP FAC	Y	A FACILITY, OTHER THAN A BUILDING, DIRECTLY RELATED TO NUCLEAR PROPULSION OPERATIONS. PLANNING AND PROGRAMMING FOR THIS FACILITY REQUIRES CONCURRENCE AND PLANNING GUIDANCE BY NAVSEA CODE 08 (NUCLEAR POWER DIRECTORATE).

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
14815	1491	S	[EA]			NUCLEAR WPNS HANDLING FAC	Y	A FACILITY, OTHER THAN A BUILDING, DIRECTLY RELATED TO NUCLEAR WEAPONS HANDLING OPERATIONS. PLANNING AND PROGRAMMING FOR THIS FACILITY PLEASE CONTACT DIRECTOR, STRATEGIC SYSTEMS PROGRAM (SSP) OFFICE.	
14817	1456	S	[EA]			SPACE SURVEILLANCE ANTENNA	N	REQUIREMENTS ARE DETERMINED BY NAVAL NETWORK AND SPACE OPERATIONS COMMAND. FACILITIES TYPICALLY SUPPORT GLOBAL SPACE SURVEILLANCE NETWORK WHICH DETECTS, TRACKS, IDENTIFIES, AND CATALOGS MAN-MADE OBJECTS IN SPACE AND PROVIDES POSITION INFORMATION ON THESE OBJECTS.	
14820	1497	S	[EA]			ORDNANCE DEMOLITION AREA	Y	AN ORDNANCE DEMOLITION (TREATMENT) AREA IS A LOCATION SPECIFICALLY DESIGNATED AND RESERVED FOR DESTROYING EXPLOSIVES AND EXPLOSIVES-LOADED DEVICES. THE FUNCTION TYPICALLY MEANS BURNING OR DETONATING EXPLOSIVES IN A BERMED OPEN BURN/OPEN DETONATION (OB/OD) AREA.	
14825	1492	S	SY [EA]			EXPLOSIVE TRUCK HOLDG YD	Y	THIS YARD IS WHERE TRUCKS CONTAINING AMMUNITION AND/OR EXPLOSIVES ARE HELD FOR INTERIM PERIODS OF TIME PRIOR TO STORAGE OR SHIPMENT. SAFE HAVENS AND WHARF YARDS NEAR PIERS AND WHARVES SHOULD BE CATEGORIZED UNDER THIS FUNCTION. EACH FACILITY REQUIRES INDIVIDUAL JUSTIFICATION. DEPENDING ON LAND CONSTRAINTS AND EXPLOSIVE SAFETY CRITERIA THESE FACILITIES MAY OR MAY NOT BE BARRICADED.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
14830	1493	S	[EA]	LF		EXPLOSIVES RR CAR HOLDG YD	Y	THIS IS A TEMPORARY HOLDING AREA FOR RAILCARS CONTAINING ORDNANCE PRIOR TO STORAGE OR SHIPMENT. EACH FACILITY REQUIRES INDIVIDUAL JUSTIFICATION. DEPENDING ON LAND CONSTRAINTS AND EXPLOSIVE SAFETY CRITERIA THESE FACILITIES MAY OR MAY NOT BE BARRICADED. FOR CONTAINERIZED ORDNANCE USE CATEGORY CODE 148 35, CONTAINER HOLDING YARD.	
14835	1492	S	SY	[EA]		CONTAINER HOLDING YARD	Y	THIS IS AN OPEN AREA THAT PROVIDES A TEMPORARY HOLDING OR STAGING AREA FOR CONTAINERS LOADED WITH EXPLOSIVE ORDNANCE. WHARF YARDS NEAR PIERS AND WHARVES ARE ALSO DESCRIBED BY THIS FUNCTION.	
14840	1492	S	SY	[EA]		CONTNR TRANSFER FAC (ORD)	Y	A CONTAINER TRANSFER FACILITY IS USED TO TRANSFER CONTAINERS BETWEEN RAIL FLATCARS AND TRUCK FLATBEDS OR CHASSIS, ON A PAVED HARDSTAND AREA, BY MEANS OF A BRIDGE CRANE OR CONTAINER HANDLING EQUIPMENT. SCALE EQUIPMENT SHOULD BE EXPECTED TO A PART OF THIS FUNCTION. THE AREA MAY BE BARRICADED OR UNBARRICADED.	
14845	1492	S	SY	[EA]		RAIL/TRUCK RECEIVING STA	Y	A RAIL/TRUCK RECEIVING STATION WEIGHS AND INSPECTS ALL INCOMING SHIPMENTS OF BREAK-BULK AND CONTAINERIZED ORDNANCE ARRIVING BY RAIL OR TRUCK AND ALSO A PERCENTAGE OF THE OUTGOING SHIPMENTS. THIS STATION CAN BE USED AS A SHORT TERM STORAGE FACILITY LIMITED TO OVERNIGHT AND WEEKEND PERIODS AND AS AN INTERCHANGE STORAGE FACILITY LIMITED TO OVERNIGHT AND WEEKEND PERIODS AND AS AN INTERCHANGE YARD.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		

This category group contains facilities such as towers and structures which support tactical or organizational aircraft related operations and which do not fall readily into another category. It includes protective construction.

14910	1495	S	[EA]			PROT BARR/REVTMENT	Y	PROTECTIVE BARRICADES (ALSO KNOWN AS REVTMENTS) ARE CONSTRUCTED AT LOCATIONS WHERE EXPLOSIVES SAFETY DICTATES THE NEED, SUCH AS IN MAGAZINE AREAS, COMBAT AIRCRAFT LOADING AREAS, EXPLOSIVE HOLDING YARDS, ETC.
14915	1467	S	[EA]	SP		FIXED PT UTIL SYS	Y	FIXED POINT UTILITIES SYSTEMS SUPPLY UTILITIES TO AIRCRAFT PARKING APRON SERVICE POINTS AND AIRCRAFT MAINTENANCE HANGAR SERVICE POINT. THE FPUS CAN PROVIDE COMPRESSED AIR, PRECONDITIONED AIR FOR HANGARED AIRCRAFT, AND/OR ELECTRICAL POWER. IT CAN CONSIST OF AN ENCLOSED PUMP HOUSE AND STORAGE TANKS, AN IN-GROUND DIST. SYSTEM AND SERVICE POINTS IN AIRCRAFT PARKING APRONS OR AIRCRAFT HANGARS.
14920	1462	S	[EA]			AIRCRAFT CATAPULT	N	THIS IS A FACILITY FOR AIR INSTALLATIONS WHERE SPECIALIZED TRAINING, TEST AND EVALUATION, OR RESEARCH AND DEVELOPMENT ARE PERFORMED ON CATAPULT TAKEOFFS.
14930	1461	S	[EA]			AIRCRAFT ARRESTING GEAR	N	AIRCRAFT ARRESTING GEAR IS DESIGNED TO BRING AN AIRCRAFT TO A STOP IN CASE OF AN ABORTED TAKEOFF OR AN EMERGENCY LANDING.
14945	3901	S	[EA]			MISSILE LAUNCH FACILITY	N	THIS CATEGORY CODE IS FOR LOCATIONS LAUNCHING MISSILES OR DRONES, IT ALSO IS PROVIDED FOR INVENTORY PURPOSES OF MISSILE AND DRONE LAUNCH PADS. SEE NAVSEA OP-5 FOR EXPLOSIVE SAFETY SITING CRITERIA OF ENERGETIC LIQUIDS ASSOCIATED WITH LAUNCH PADS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
14950	1464	S		[EA]	LF	BLAST DEFLECTOR FENCE	N	BLAST DEFLECTOR FENCES ARE STRUCTURES THAT DIRECT THE EXHAUST FROM JET ENGINES UPWARD. THEY ARE USED IN CONGESTED AREAS AND PARKING AND MAINTENANCE AREAS TO PROTECT PERSONNEL AND FACILITIES FROM THE BLAST EFFECT OF JET ENGINE EXHAUST. BLAST FENCES ARE ALSO USED TO PREVENT EROSION OF PAVED AND UNPAVED AREAS AND TO PROVIDE PROTECTION FROM FLYING DEBRIS.	
14985	1467	S	SY	[EA]		EXPEDITIONARY AIR CONTROL	Y	THESE ARE MARINE CORPS FACILITIES REQUIRED TO ACCOMMODATE, IN- GARRISON, THE EQUIPMENT USED FOR EXPEDITIONARY AIRCRAFT COMMAND AND CONTROL. THESE FACILITIES ARE ASSIGNED TO SPECIALIZED MARINE CORPS SQUADRONS, AND THE EXPEDITIONARY EQUIPMENT USED IN CONJUNCTION WITH THESE FACILITIES IS NORMALLY SQUADRON PROPERTY.	
14986	4422	S	SF	[EA]		OPERATIONS SUPPORT SHED	Y	STORAGE SHED OR OTHER COVERED AREA USED FOR OPERATIONAL SUPPORT. NOT FOR WEAPONS CLEANING AREAS.	
150						WATERFRONT OPRTNL FAC			
151						PIERS			
Includes all piers regardless of function served, protective dolphins at pier heads, fendering systems, mooring fixtures, original dredging performed specifically for the purpose of providing the pier facility, all trackage on the pier, and all supporting utilities and services.									
15110	1511	S	SY	[FB]	DW	AMMUNITION PIER	Y	AMMUNITION PIERS ARE DESIGNED FOR USE IN THE RECEIPT OF AMMUNITION FOR STORAGE AND FOR THE OUTLOADING OF AMMUNITION ONTO BARGES AND SHIPS. IN SOME CASES OUTGOING AMMUNITION IS FIRST LOADED FROM THE AMMUNITION PIER ONTO BARGES FOR TRANSFER TO SHIPS MOORED OFFSHORE OR IN A ROADSTEAD.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG IND.	DESCRIPTION
			AREA	OTHER	ALT			
15120	1511	S	SY	[FB]	DW	GENL PURP/BERTHING PIER	Y	GENERAL PURPOSE BERTHING PIERS ARE USED PRIMARILY FOR MOORING HOME PORTED AND TRANSIENT SHIPS THAT DO NOT REQUIRE PIERS EQUIPPED WITH SHIPYARD FACILITIES. BERTHING PIERS ARE CLASSIFIED AS ACTIVE OR INACTIVE. THE ACTIVE BERTHING PIERS ARE USED WHEN SHIPS ARE BERTHED FOR A RELATIVELY SHORT TIME; THE INACTIVE CLASSES ARE USED WHEN SHIPS ARE TO BE TIED UP FOR LONG PERIODS IN A DECOMMISSIONED STATUS.
15140	1511	S	SY	[FB]	DW	FUELING PIER	Y	FACILITIES FOR BERTHING SHIPS WHILE DISCHARGING FUEL TO STORAGE OR RECEIVING FUEL FROM STORAGE ARE PROVIDED AT FUELING PIERS. SUCH PIERS WILL PROVIDE SALT WATER FOR FIREFIGHTING, TELEPHONE AND FIRE ALARM FACILITIES AND MAY PROVIDE FRESHWATER, STEAM IN COLD CLIMATES, ELECTRIC POWER.
15150	1511	S	SY	[FB]	DW	REPAIR PIER	Y	REPAIR PIERS ARE CONSTRUCTED AND EQUIPPED TO PERMIT OVERHAUL OF THOSE PORTIONS OF A VESSEL ABOVE THE WATERLINE. THESE STRUCTURES WILL NORMALLY BE EQUIPPED WITH A GANTRY CRANE AND STANDARD-GAGE RAILROAD TRACKS AND HAVE FACILITIES TO PROVIDE SALT AND FRESHWATER, STEAM, COMPRESSED AIR, TELEPHONE AND FIRE ALARM SERVICE, AND ELECTRIC POWER FOR SHIP SERVICE, LIGHTING AND WELDING.
15160	1511	S	SY	[FB]	DW	SUPPLY PIER	Y	SUPPLY PIERS ACCOMMODATE BERTHING FOR THE TRANSFER OF MATERIALS BETWEEN SHIP AND SHORE. A LARGE BUILDING OR TRANSIT SHED NORMALLY OCCUPIES THE CENTRAL PORTION OF A SUPPLY PIER.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
15170	1511	S	SY	[FB]	DW	ORDNANCE CONT HANDL PIER	Y	AN ORDNANCE CONTAINER HANDLING PIER IS USED PRIMARILY FOR THE OUTLOADING AND RECEIVING OF EXPLOSIVE ORDNANCE IN CONTAINERS FROM NON-SELF-SUSTAINING CONTAINER SHIPS.
15171	1511	S	SY	[FB]	DW	DEGAUSSING PIER	Y	THESE PIERS ARE USED TO ERASE THE MAGNETIC SIGNATURE OF A SHIP OR SUBMARINE. SIZING FOR THIS CATEGORY CODE IS BASED ON THE TYPE OF VESSELS TO BE SERVICED AND IS DRIVEN BY THE NAVSEA SPECIFIED EQUIPMENT. SPECIAL STUDIES ARE REQUIRED ON A CASE BY CASE BASIS.
15180	1511	S	SY	[FB]	DW	DEPERMING PIER	Y	THESE PIERS ARE USED TO ERASE THE MAGNETIC SIGNATURE OF A SHIP OR SUBMARINE. SIZING FOR THIS CATEGORY CODE IS BASED ON THE TYPE OF VESSELS TO BE SERVICED AND IS DRIVEN BY THE NAVSEA SPECIFIED EQUIPMENT. SPECIAL STUDIES ARE REQUIRED ON A CASE BY CASE BASIS.
15190	1513	S	[SY]		SF	ACCESS TRESTLE PIERS WHRVS	Y	A VEHICULAR AND/OR RAILROAD TRESTLE CONNECTING SHORE FACILITIES TO A PIER OR WHARF.

152 WHARFS

A wharf is an open type marginal structure for the berthing of vessels; it is usually connected to the shore at more than one point. In general, the planning criteria that apply to piers are also applicable to wharves. Either may serve the same practicable purpose, however, since their physical design and layout will be much different, their capacities for berthing and cargo handling will vary. Piers are generally preferable structures; however, certain locations will dictate the use of a wharf rather than a pier because of the marginal fairway and topography involved.

15210	1512	S	SY	[FB]	DW	AMMUNITION WHARF	Y	AMMUNITION WHARVES ARE DESIGNED FOR USE IN THE RECEIPT OF AMMUNITION FOR STORAGE AND FOR THE OUTLOADING OF AMMUNITION ONTO BARGES AND SHIPS. IN SOME CASES OUTGOING AMMUNITION IS FIRST LOADED FROM THE AMMUNITION PIER ONTO BARGES FOR TRANSFER TO SHIPS MOORED OFFSHORE OR IN A ROADSTEAD.
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## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
15220	1512	S	SY	[FB]	DW	GENL PURP/BERTHING WHARF	Y	GENERAL PURPOSE BERTHING WHARVES ARE USED PRIMARILY FOR MOORING HOME PORTED AND TRANSIENT SHIPS THAT DO NOT REQUIRE PIERS EQUIPPED WITH SHIPYARD FACILITIES. BERTHING PIERS ARE CLASSIFIED AS ACTIVE OR INACTIVE. THE ACTIVE BERTHING PIERS ARE USED WHEN SHIPS ARE BERTHED FOR A RELATIVELY SHORT TIME; THE INACTIVE CLASSES ARE USED WHEN SHIPS ARE TO BE TIED UP FOR LONG PERIODS IN A DECOMMISSIONED STATUS.	
15230	1512	S	SY	[FB]	DW	FITTING OUT WHARF	Y	WHARVES FOR FITTING OUT ARE VERY SIMILAR TO THOSE USED FOR REPAIR PURPOSES, PROVIDING APPROXIMATELY THE SAME FACILITIES. HOWEVER, FITTING OUT PIERS WILL HAVE, IN ADDITION TO LIGHT AND HEAVY GANTRY CRANES, A LARGE FIXED TOWER CRANE FOR HANDLING GUNS, TURRETS, ENGINES, AND HEAVY ARMOR.	
15240	1512	S	SY	[FB]	DW	FUELING WHARF	Y	FACILITIES FOR BERTHING SHIPS WHILE DISCHARGING FUEL TO STORAGE OR RECEIVING FUEL FROM STORAGE ARE PROVIDED AT FUELING WHARVES. SUCH WHARVES WILL PROVIDE SALT WATER FOR FIREFIGHTING, TELEPHONE AND FIRE ALARM FACILITIES AND MAY PROVIDE FRESHWATER, STEAM IN COLD CLIMATES, ELECTRIC POWER.	
15250	1512	S	SY	[FB]	DW	REPAIR WHARF	Y	REPAIR WHARVES ARE CONSTRUCTED AND EQUIPPED TO PERMIT OVERHAUL OF THOSE PORTIONS OF A VESSEL ABOVE THE WATERLINE. THESE STRUCTURES WILL NORMALLY BE EQUIPPED WITH A GANTRY CRANE AND STANDARD-GAGE RAILROAD TRACKS AND HAVE FACILITIES TO PROVIDE SALT AND FRESHWATER, STEAM, COMPRESSED AIR, TELEPHONE AND FIRE ALARM SERVICE, AND ELECTRIC POWER FOR SHIP SERVICE, LIGHTING AND WELDING.	



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
15260	1512	S	SY	[FB]	DW	SUPPLY WHARF	Y		SUPPLY WHARVES ACCOMMODATE BERTHING FOR THE TRANSFER OF MATERIALS BETWEEN SHIP AND SHORE. A LARGE BUILDING OR TRANSIT SHED NORMALLY OCCUPIES THE CENTRAL PORTION OF A SUPPLY WHARF.
15270	1512	S	SY	[FB]	DW	ORDNANCE CONT HANDL WHARF	Y		AN ORDNANCE CONTAINER HANDLING WHARF IS USED PRIMARILY FOR THE OUTLOADING AND RECEIVING OF EXPLOSIVE ORDNANCE IN CONTAINERS FROM NON-SELF-SUSTAINING CONTAINER SHIPS.
15271	1512	S	SY	[FB]	DW	DEGAUSSING WHARF	Y		THESE WHARVES ARE USED TO ERASE THE MAGNETIC SIGNATURE OF A SHIP OR SUBMARINE. SIZING FOR THIS CATEGORY CODE IS BASED ON THE TYPE OF VESSELS TO BE SERVICED AND IS DRIVEN BY THE NAVSEA SPECIFIED EQUIPMENT. SPECIAL STUDIES ARE REQUIRED ON A CASE BY CASE BASIS.
15280	1512	S	SY	[FB]	DW	DEPERMING WHARF	Y		THESE WHARVES ARE USED TO ERASE THE MAGNETIC SIGNATURE OF A SHIP OR SUBMARINE. SIZING FOR THIS CATEGORY CODE IS BASED ON THE TYPE OF VESSELS TO BE SERVICED AND IS DRIVEN BY THE NAVSEA SPECIFIED EQUIPMENT. SPECIAL STUDIES ARE REQUIRED ON A CASE BY CASE BASIS.

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153 CARGO HANDLING FACILITIES

A cargo staging area is an open hardstand for temporary storage of cargo awaiting further transshipment.

15310	1531	S		[SY]		CARGO STAGING AREA	Y		A CARGO STAGING AREA IS AN OPEN HARDSTAND FOR TEMPORARY STORAGE OF CARGO AWAITING FURTHER TRANSSHIPMENT.
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154 SEAWLS/BULKHDS/Q  
UAYWLS

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
Shore protective structures not intended primarily for berthing vessels. Bulkheads and quaywalls have the principal advantage of affording accessibility for their entire length along the foreshore.									
15410	1541	S		[LF]		BLKHD QW NO RELIEVG PLATFM	N		THIS TYPE OF BULKHEAD OR QUAYWALL IS A STRUCTURE TO RETAIN EARTH ALONG A SHORELINE IN SHALLOW WATER. THE DEPTH OF WATER IS TYPICALLY LIMITED TO A 25 FEET AND THE STRUCTURE HAS NO RELIEVING PLATFORM. THIS STRUCTURE DOES NOT PROVIDE SHIP BERTHING (151 PIERS AND 152 WHARVES SHOULD BE USED FOR ANY SHIP BERTHING REQUIREMENT).
15420	1512	S	SY	[LF]		BLKHD QW WITH R PLATFM	Y		THIS TYPE OF BULKHEAD OR QUAYWALL IS A STRUCTURE TO RETAIN EARTH ALONG A SHORELINE IN DEEP WATER. TYPICALLY WITH A WATER DEPTH EXCEEDING 25 FEET AND INCLUDES A RELIEVING PLATFORM TO SUPPORT HEAVY LOGISTICS OPERATIONS. THIS STRUCTURE DOES NOT PROVIDE SHIP BERTHING (151 PIERS AND 152 WHARVES SHOULD BE USED FOR ANY SHIP BERTHING REQUIREMENT).
15430	1541	S		[LF]		SEAWALLS AND RIP RAP	N		THESE ARE STRUCTURES BUILT ALONG AND PARALLEL TO A SHORELINE (RIVER OR COAST LINE) PROTECTING AND STABILIZING THE SHORE AGAINST EROSION RESULTING FROM WAVE AND CURRENT ACTION. THIS IS A FUNCTIONAL DEFINITION AND VARIOUS TYPES OF CONSTRUCTION CAN BE USED TO SUPPORT THIS FUNCTION.

155 SMALL CRAFT  
BERTHING

All facilities supporting small craft operations. Included in this category are, but not limited to, yard craft, tug boats, security and service craft.

15510	1551	S		[FB]		FLEET LANDING	Y		A FLEET LANDING IS A FIXED OR FLOATING PIER DESIGNED FOR THE LOADING AND/OR UNLOADING OF A SHIP'S PERSONNEL ONTO OR FROM A PERSONNEL BOAT OR FERRY.
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## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
15511	1552	B	[SF]			FLEET LANDING BUILDING	Y	A FLEET LANDING BUILDING IS USED TO ACCOMMODATE SHIP'S PERSONNEL BEING LOADED OR UNLOADED FROM A PERSONNEL BOAT OR FERRY.	
15520	1551	S		[FB]		SMALL CRAFT BERTHING	Y	THIS CATCODE SHOULD INCLUDE FACILITIES FOR HARBOR AND PILOT LAUNCHES, SURVEY BOATS, WORK BOATS, SPECIAL SERVICE CRAFT, RESCUE BOATS, AND OTHER SMALL CRAFT.	
15521	1552	B	[SF]			SMALL CRAFT BOATHOUSE	Y	A BOATHOUSE IS NECESSARY WHERE AN ALERT CREW IS REQUIRED, WHERE A BOAT FACILITY IS REMOTE FROM THE SUPPORTING ACTIVITY, OR WHERE BOAT REPAIR FACILITIES ARE ESSENTIAL.	
15522	1593	S	SY	[EA]		SM CRAFT BOAT RAMP FAC	Y	SMALL BOAT LAUNCH RAMPS FOR OPERATIONAL OR SECURITY FORCES THE PURPOSES OF CONDUCTING IN-SHORE TRAINING MANEUVERS OR SECURITY PATROLS.	
156						CARGO HANDLING FAC/BLDGS			
15610	1443	B	[SF]			WATERFRONT TRANSIT SHED	Y	A WATERFRONT TRANSIT SHED IS A BUILDING OR SHED FOR STORAGE OF CARGO AWAITING FURTHER TRANSSHIPMENT AND REQUIRING PROTECTION.	
15620	1443	B	[SF]			CONTAINER OPERATIONS BLDG	Y	A CONTAINER OPERATIONS BUILDING IS ESSENTIAL FOR SAFE DIRECTION AND CONTROL OF CONTAINER OPERATIONS TO PROMOTE EFFICIENT AND CONTINUOUS FLOW TO, WITHIN, AND FROM THE HANDLING AREA.	
159						OTHER WATERFRONT OPERATION			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
This basic category group provides for facilities which cannot be coded in basic groups 151 through 156.									
15910	1593	S	SY	[EA]		AIRCRAFT DOCKING FACILITY	N		WATERFRONT FACILITIES THAT WERE ORIGINALLY CREATED TO SUPPORT SEAPLANES SUCH AS PBY CATALINAS AND SIMILAR FROM THE WWII ERA AND LATER. IT IS NOT ASSOCIATED WITH ANY AIRFIELD CRITERIA AND NEW FACILITIES WILL NOT BE PLANNED UNDER THIS CCN.
15920	1431	B	SF	[EA]		DEGAUSSING BUILDING	Y		DEGAUSSING IS THE SCIENCE DEALING WITH THE METHODS AND TECHNIQUES OF REDUCING A SHIP'S MAGNETIC FIELD SO THAT THE POSSIBILITY OF DETECTION BY MAGNETIC MINES AND OTHER MAGNETIC INFLUENCE DETECTION DEVICES IS MINIMIZED. IT CONSISTS OF TWO FUNCTIONALLY INTERDEPENDENT INSTALLATIONS: AN UNDERWATER DEGAUSSING RANGE INSTALLATION AND THIS FACILITY, WHICH SERVES AS AN INSTRUMENT STATION.
15921	1591	S		[EA]		DEGAUSSING RANGE	N		A DEGAUSSING RANGE IS AN AREA SET ASIDE IN A CHANNEL OR HARBOR THAT CONTAINS SUBMERGED INSTRUMENTS, CONNECTED TO THE COMPUTER IN THE DEGAUSSING BUILDING (CATEGORY CODE 159 20), WHICH REGISTERS A SHIP'S MAGNETIC SIGNATURE AS IT PASSES THROUGH THE RANGE.
15930	1431	B	SF	[EA]		DEPERMING BUILDING	Y		A DEPERMING BUILDING IS A FACILITY THAT CONTAINS ELECTRICAL INSTRUMENTS USED TO REGULATE AND MONITOR THE DEPERMING OPERATION. DEPERMING, THE SECOND PHASE OF DEGAUSSING, IS THE PROCESS BY WHICH A SHIP'S PERMANENT LONGITUDINAL AND ATHWARTSHIP MAGNETISM IS REMOVED AND ITS PERMANENT VERTICAL MAGNETISM STABILIZED AT A LOW LEVEL.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
15950	1551	S	[FB]			FERRY SLIP	N	A FERRY SLIP PROVIDES THE ANCHORAGE FOR FERRIES WHILE LOADING OR UNLOADING. IT CONSISTS OF WATER AREAS DIRECTLY IN FRONT OF TRANSFER BRIDGES AND IS USUALLY BORDERED BY FENDER RACKS.	
15964	1431	B	[SF]	EA		WATERFRONT OPERATIONS BLDG	Y	A WATERFRONT OPERATIONS BUILDING, PROVIDES FOR ALL SHIP BERTHING, SMALL CRAFT MAINTENANCE INCLUDING RELATED ELECTRONICS SYSTEMS, AND PROVIDING SUCH FACILITIES AS A DUTY CREW BUNK ROOM, CREW'S LOUNGE, BOATSWAIN'S LOCKER, BERTHING FOR SMALL BOATS IF AN INTEGRAL PART OF THE BUILDING, SPACE FOR STORAGE OF BOAT GEAR AND PAINT, OIL SPILL EQUIPMENT AND A BATTERY CHARGING ROOM.	
15966	1593	S	SY	[EA]		LANDING CRAFT RAMP	Y	A WATERFRONT LAUNCH RAMP FOR PURPOSES OF LAUNCH AND RETRIEVAL OF LANDING CRAFT.	
160						HARBOR AND COASTAL FAC			
161						HARBOR PROTECTION FAC			
This basic category provides facilities for protecting the harbor against military action.									
16120	1611	S	[EA]			FIXED NET ANCHORAGE	N	THIS CATEGORY CODE INCLUDES SUCH FUNCTIONS AS PILE CLUSTERS AND PLATFORMS USED TO SUPPORT ANTI-TERRORISM/FORCE PROTECTION (AT/FP) FLOATING BARRIERS. IF A TRADITIONAL SUBMERGED HARBOR NET IS USED, THIS TYPE OF FEATURE WOULD ALSO BE REQUIRED.	
16130	1611	S	SF	[EA]		WINCH HOUSE	N	A WINCH HOUSE IS A STRUCTURE USED IN CONTROL OF HARBOR NETS, FLOATING BARRIERS AND OIL BOOMS.	
162						COASTAL PROTECTION FAC			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		

This basic category provides facilities for protecting the coast against military action.

16210	1499	S	[EA]		GUN EMPLACEMENTS	N	SPACE IN STRATEGIC SITES IS PROVIDED ON BASE FOR THE INSTALLATION OF GUN EMPLACEMENTS, INCLUDING ANTI-AIRCRAFT GUNS, FOR USE IN HARBOR DEFENSE.
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163 MOORINGS

Fixed structures for mooring vessels.

16310	1631	S	[EA]		MOORING DOLPHIN	N	MOORING DOLPHINS ARE INDEPENDENT STRUCTURES THAT ARE OFTEN PLACED AT THE OUTBOARD ENDS OF PIERS OR WHARVES TO PROVIDE A MOORING POINT THAT PERMITS TYING MOORING LINES AT FAVORABLE ANGLES WITHOUT HAVING TO EXTEND THE ENTIRE PIER OR WHARF STRUCTURE.
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16320	1631	S	[EA]		MOORING PLATFORM	N	A MOORING PLATFORM IS AN ISOLATED STRUCTURE CONSISTING OF A TIMBER, STEEL OR CONCRETE DECK SUPPORTED ON PILING OR CAN BE A STEEL PILE, SHEET PILE OR CONCRETE TYPE CAISSON. TWO OR MORE PLATFORMS ARE PROVIDED IN LINE FOR BERTHING OF ONE OR MORE VESSELS ALONGSIDE.
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16330	1631	S	[EA]		STAKE PILE MOORING	N	A STAKE PILE MOORING CONSISTS OF A STAKE PILE DRIVEN BELOW THE SURFACE OF THE FIRM BOTTOM OF THE OCEAN FLOOR. A CHAIN ATTACHED TO THE STAKE IS USED TO MOOR THE VESSEL.
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164 MARINE  
IMPROVEMENTS

Structures for protecting the harbor, land area, or coastline from current or wave action and from flood conditions.

16410	1641	S	[LF]	EA	BREAKWATER	N	A BREAKWATER IS A FREESTANDING BARRIER DESIGNED TO BREAK UP AND DISPERSE HEAVY SEAS AND TO SHIELD THE WATERS OF A HARBOR FROM WAVE ACTION.
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16420	1641	S	[LF]	EA	GROINS AND JETTIES	N	GROINS AND JETTIES ARE STRUCTURES BUILT TO INTERCEPT AND DEFLECT CURRENTS TO CONTROL LITTORAL DRIFT AND DEPOSIT OF SAND AND SILT.
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## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
16430	8714	S	[LF]	EA	LEVEES	N		LEVEES ARE EARTHEN EMBANKMENTS DESIGNED TO PROTECT PROPERTY FROM WATER DAMAGE DURING THE FLOOD STAGE OF RIVERS AND/OR OTHER HIGH WATER.	
165					DREDGING				
Original dredging such as channel and turning basin dredging not directly related to the specific construction of a facility is planned under Basic Category 165. Dredging performed primarily to provide fill shall be coded under Basic Category 932, Site Improvement. Dredging directly related to the specific construction of an item shall bear the same code as the item. Do not use this category code for inventory purposes.									
169					OTHER HARBOR & COASTAL				
Harbor and entrance control points and signal towers.									
16910	1611	S	[EA]		HARBOR ENTRANCE CONTR FAC	N		A LARGE PAVED SITE FOR LAYOUT AND ASSEMBLY OF HARBOR NETS AND ALLIED EQUIPMENT. THE LAYOUT AREA SHOULD BE NEAR THE WATERFRONT AND ACCESSIBLE TO MOBILE CRANES FOR NET AND EQUIPMENT HANDLING. THE AREA IS KNOWN AS THE NET DEPOT AND IS USED FOR NET MAINTENANCE AND FOR TRAINING IN NET HANDLING.	
170					TRAINING FACILITIES				
Facilities designated for the service career and reserve training of Navy and Marine Corps personnel. There are two basic categories under this code: 171 TRAINING BUILDINGS, and 179 TRAINING FACILITIES OTHER THAN BUILDINGS									
171					TRAINING BUILDINGS				

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		

Class room/special buldings designed to provide space for training and general instruction. Facilities in this basic category are identified according to the nature of instruction provided. The major building types are: 171-1.1 Academic Instruction Building, 171-1.2 Reserve Training Building, 171-1.3 Applied Instruction Building, and 171-1.4 Operational Trainer Space.

17110	1711	B	[SF]		PN	ACADEMIC INSTRUCTION BLDG	Y	THERE ARE GENERALLY TWO TYPES OF CLASSROOM: GENERAL ACADEMIC CLASSROOM - IS ONE WHICH SUPPORTS APPROVED TRAINING PROGRAMS AND PROVIDES ACCOMMODATIONS FOR CLASSROOM LECTURE INSTRUCTION, AND MODIFIED ACADEMIC CLASSROOM - IS ONE WHICH IS EQUIPPED WITH DESKS OR OTHER WORKING SURFACES
17115	1714	B	[SF]		PN	NAVY & MC RSRV TRNG BLDG	Y	THIS CATEGORY CODE REFERS TO THE RESERVE TRAINING CENTER ONLY. CRITERIA FOR OTHER FACILITIES NOT INCLUDED IN THIS SECTION (E.G., UNACCOMPANIED HOUSING, DINING, AIRCRAFT MAINTENANCE HANGARS, ETC.) FOLLOW THE SAME CRITERIA AS ACTIVE DUTY, AND CAN BE FOUND IN THE SUBSEQUENT CATEGORY CODES. REFER TO NAVFAC P-72 FOR A FUNCTION / CATEGORY CODE CROSS-REFERENCE.
17117	1441	B	[SF]			TV CTR/INSTRUCTION MATTER	Y	THIS FACILITY MAY BE PROVIDED ONLY WHEN SPECIFICALLY AUTHORIZED BY CNET. REQUIREMENTS WILL BE DETERMINED FOR EACH INDIVIDUAL CASE, WITH CNET GUIDANCE.
17120	1712	B	[SF]		PN	APPLIED INSTRUCTION BLDG	Y	THIS FACILITY PROVIDES FOR TRAINING PERSONNEL THROUGH THE APPLIED USE OF TECHNICAL EQUIPMENT AND TOOLS.
17125	7431	B	[SF]		SE	GEN PRPSE AUDITORIUM	Y	AN AUDITORIUM MAY BE AUTHORIZED WHEN REQUIRED AS AN ADJUNCT TO TRAINING OR OTHER FUNCTIONS (EXCEPT ADMINISTRATION). THE PRIMARY PURPOSE OF THE AUDITORIUM IS AN ASSEMBLY AREA FOR INSTRUCTION AND TRAINING.



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17130	1715	B	[SF]			PE FACILITY	Y	A SERVICE ACADEMY LEVEL PHYSICAL FITNESS TRAINING FACILITY FOR USE BY THE US NAVAL ACADEMY.	
17135	1721	B	[SF]			OPERATIONAL TRAINER FAC	Y	THIS FACILITY HOUSES LARGE OPERATIONAL TRAINERS, USUALLY DUPLICATING PART OR ALL OF SURFACE OR AIR WEAPONS SYSTEM.	
17136	1724	B	[SF]			RADAR SIMULATOR FACILITY	Y	THIS FACILITY HOUSES VARIOUS RADAR TRAINING FACILITIES AND MAY BE PROVIDED ONLY WHEN SPECIFICALLY AUTHORIZED BY CNET. REQUIREMENTS WILL BE DETERMINED FOR EACH INDIVIDUAL CASE, WITH CNET GUIDANCE.	
17140	1714	B	[SF]			DRILL HALL	Y	A COMPONENT OF A RESERVE TRAINING FACILITY USED PRIMARILY TO PRACTICE DRILLING AND MARCHING.	
17145	1732	B	[SF]			MOCK-UP TRNG AID PREP CTR	Y	FACILITY FOR THE CONSTRUCTION, MAINTENANCE, AND REPAIR OF TRAINING MOCK UPS FOR TRAINING FACILITIES.	
17150	1718	B	[SF]		FP	SMALL ARMS RANGE - INDOORS	Y	AN INDOOR SMALL ARMS RANGE PROVIDES TRAINING SPACE FOR THE USE OF PISTOLS AND SMALL CALIBER (22) RIFLES. RANGES WILL BE USED BY ALL SERVICES ON A JOINT BASIS WHEN FEASIBLE, AND THEY MUST BE OF SUFFICIENT SIZE AND CAPACITY TO PROVIDE CONTINUAL TRAINING AND RETRAINING FOR ALL MILITARY PERSONNEL THAT REQUIRE WEAPONS TRAINING/QUALIFICATION.	
17160	6100	B	[SF]		PN	RECRUIT PROCESSING BLDG	Y	A RECRUIT PROCESSING BUILDING IS A FACILITY FOR RECEIVING, EXAMINING, AND OUTFITTING RECRUITS. THE PROCESSING BUILDING MUST PROVIDE SPACE FOR THE COMPLETE ORIENTATION, EXAMINATION, AND PROCESSING (MEDICAL, DENTAL, SUPPLY, ADMINISTRATIVE) OF ALL NEWLY INDUCTED AND RECRUITED PERSONNEL.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17177	1732	B	[SF]			TRNG MATRL STRG	Y	STORAGE FACILITIES FOR MISCELLANEOUS GOODS OR EQUIPMENT RELATED TO TRAINING FACILITY SUPPORT WILL BE PROVIDED ONLY WHERE IT CAN BE INDIVIDUALLY JUSTIFIED. THERE ARE NO CRITERIA FOR THIS TYPE OF FACILITY.	
172						SIMULATION FACILITIES			
17230	1723	B	[SF]			GAS CHAMBER	Y	A GAS CHAMBER IS A BUILDING USED FOR TRAINING PERSONNEL IN THE USE OF PROTECTIVE MASKS AND THE EFFECTS OF CHEMICAL WARFARE.	
173						TRAINING SUPPORT FACILITIES			
17310	1731	B	[SF]			RANGE OPERATIONS BLDG	Y	RANGE OPERATIONS BUILDINGS ARE DESIGNED FOR DIRECT SUPPORT TO RANGE OPERATIONS. SUCH BUILDINGS CAN SUPPORT A VARIETY OF OPERATIONS FOR A FIRING RANGE, SUCH AS : RANGE OPERATIONS, ADMINISTRATIVE SUPPORT, TARGET STORAGE AND ISSUE, EQUIPMENT STORAGE AND MAINTENANCE, AND AMMUNITION BREAKDOWN AND DISTRIBUTION (NOT STORAGE).	
17311	1731	B	[SF]			RANGE SUPPORT BLDG	Y	A RANGE SUPPORT BUILDING WOULD BE A BUILDING WHICH HOUSES SUPPORT FUNCTIONS CONDUCTED AT THE RANGE COMPLEX, BUT NOT COVERED ELSEWHERE. THIS INCLUDES RANGE BILLETTS, CLASSROOM SPACE AT A RANGE, BUILDINGS TO CONDUCT AFTER ACTION REVIEWS, AND ALL OTHER RANGE SUPPORT ACTIVITIES WITH THE EXCEPTION OF ACTIVITIES DESCRIBED IN RANGE OPERATIONS BUILDING, WEAPONS RANGE OBSERVATION TOWER, AND PUBLIC TOILET.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17320	1732	B	[SF]			TRAINING AIDS CENTER	Y	A TRAINING AIDS CENTER IS A BUILDING THAT IS USED TO FABRICATE, MAINTAIN, STORE, AND ISSUE TRAINING DEVICES AND MATERIALS INCLUDING MULTIPLE INTEGRATED LASER EQUIPMENT SYSTEM (MILES) AND VISUAL INFORMATION (VI) AIDS; IT ALSO PROVIDES THE ADMINISTRATIVE SPACE FOR THE TRAINING SUPPORT DIVISION (TSD) MANAGEMENT STAFF.	
17330	1733	S	[SF]			COVERED TRAINING AREA	Y	COVERED TRAINING AREAS ARE STRUCTURES WHICH PROVIDE A COVERED AREA TO SUPPORT AND CONDUCT TRAINING OR FOR FEEDING OF PERSONNEL ON A TRAINING FACILITY WHILE PROVIDING PROTECTION FOR EQUIPMENT AND PERSONNEL FROM THE ELEMENTS.	
<hr/>									
174						IMPACT, MANVR, TRNG AREAS			
<p>All space for ground and air combat forces to practice movements and tactics. This includes all area having designated boundaries within which all ordnance will detonate or impact.</p>									
17410	1741	S	[AC]			MNVR/TRNG AREA, LT FORCES	N	THIS CATEGORY INCLUDES ALL SPACE FOR GROUND AND AIR COMBAT FORCES TO PRACTICE MOVEMENTS AND TACTICS. DIFFERENT TYPES OF UNITS MAY SUPPORT ONE ANOTHER (COMBINED ARMS), OR A UNIT MAY OPERATE INDEPENDENTLY. THE 'LIGHT' DESIGNATION REFERS TO AREAS WHERE MANEUVER IS RESTRICTED TO ONLY SMALL UNITS OR UNITS HAVING ONLY WHEELED VEHICLES.	
17411	1741	S	[AC]			MNVR/TRNG AREA, AMPHIB	N	THIS CATEGORY INCLUDES ALL SPACE FOR GROUND AND AIR COMBAT FORCES TO PRACTICE MOVEMENTS AND TACTICS DURING AMPHIBIOUS (SHIP-TO-SHORE) OPERATIONS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17412	1741	S	[AC]	EA		LAND NAVIGATION COURSE	N	A LAND NAVIGATION COURSE IS AN AREA LOCATED WITHIN THE TRAINING COMPLEX WHICH IS PRINCIPALLY SCHEDULED AND USED FOR MAP READING, TERRAIN ASSOCIATION, OR NAVIGATIONAL TRAINING.	
17413	1741	S	[AC]	EA		FIELD TRAINING AREA	N	A FIELD TRAINING AREA IS A SPECIFIC AREA THAT IS INTENDED FOR THE TRAINING OF PERSONNEL OR ANIMALS IN A FIELD ENVIRONMENT THAT CANNOT BE CATEGORIZED BY THE OTHER CATEGORY CODES IN THE 174 BASIC SERIES. TRAINING CONDUCTED IN SUCH AN AREA MAY INCLUDE MEDICAL, K-9, OR COMMUNICATIONS EQUIPMENT.	
17420	1742	S	[AC]			MNVR/TRNG AREA, HEAVY	N	THIS CATEGORY INCLUDES ALL SPACE FOR GROUND AND AIR COMBAT FORCES TO PRACTICE MOVEMENTS AND TACTICS. DIFFERENT TYPES OF UNITS MAY SUPPORT ONE ANOTHER (COMBINED ARMS), OR MAY OPERATE INDEPENDENTLY. THE ¿HEAVY¿ DESIGNATION REFERS TO AREAS WHERE MANEUVER IS UNRESTRICTED AND CAN CONSIST OF ALL TYPES OF VEHICLES AND EQUIPMENT, INCLUDING TRACKED VEHICLES.	
17430	1743	S	[AC]			IMPACT AREA DUDDDED	N	AN AREA HAVING DESIGNATED BOUNDARIES WITHIN WHICH ALL ORDNANCE WILL DETONATE OR IMPACT SHALL BE CATEGORIZED AS IMPACT AREA DUDDDED. THIS AREA INCLUDES ALL IMPACT AREAS THAT DO NOT CONTAIN AUTOMATED TARGETS OR TARGETS CLASSIFIED AS REAL PROPERTY.	
17431	1743	S	[AC]			IMPACT AREA NON- DUDDDED	N	AN AREA HAVING DESIGNATED BOUNDARIES WITHIN WHICH ORDNANCE THAT DOES NOT PRODUCE DUDS WILL IMPACT IS AN IMPACT AREA NON- DUDDDED. THIS AREA IS COMPOSED MOSTLY OF THE SAFETY FANS FOR SMALL ARMS RANGES.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17440	1744	S	[AC]	EA		PERS/EQUIP DROP ZONE	N	A LARGE, FLAT, CLEARED AREA FOR PERSONNEL AND EQUIPMENT TO LAND FOLLOWING A PARACHUTE JUMP SHALL BE CATEGORIZED AS A PERSONNEL/EQUIPMENT DROP ZONE.	
175						SMALL ARMS RANGES			
17501	1750	S	AC		[FP]	AUTOMATIC RIFLE RANGE	Y	THE AUTOMATIC RIFLE RANGE IS DESIGNED FOR TRAINING TARGET ENGAGEMENT TECHNIQUES WITH RIFLES AND SQUAD AUTOMATIC WEAPON (SAW). THIS RANGE IS USED TO TRAIN PERSONNEL ON THE SKILLS NECESSARY TO EMPLOY AUTOMATIC AND SEMI- AUTOMATIC FIRING TECHNIQUES.	
17502	1750	S	AC		[FP]	NON-STD SMALL ARMS RANGE	Y	THE NON-STANDARD SMALL ARMS RANGE IS DESIGNED FOR TRAINING REQUIREMENTS THAT ARE NOT ASSOCIATED WITH CURRENT PUBLISHED DOCTRINE, BUT FALL WITHIN A COMMANDER'S TRAINING REQUIREMENTS. THIS RANGE INCLUDES ALL SMALL ARMS RANGES THAT DO NOT FIT INTO OTHER CATEGORIES.	
17510	1751	S	AC		[FP]	BASIC ZERO FIRING RANGE	Y	A BASIC ZERO FIRING RANGE IS DESIGNED FOR TRAINING SHOT- GROUPING AND ZEROING EXERCISES WITH RIFLES AND MACHINE GUNS. THIS RANGE IS USED TO TRAIN INDIVIDUAL PERSONNEL ON THE SKILLS NECESSARY TO ALIGN THE SIGHTS AND PRACTICE BASIC MARKSMANSHIP TECHNIQUES AGAINST STATIONARY TARGETS.	
17520	1752	S	AC		[FP]	AUTO FLD FIRE (AFF) RANGE	Y	AN AUTOMATE FIELD FIRE RANGE IS DESIGNED FOR TRAINING TARGET ENGAGEMENT TECHNIQUES WITH RIFLES. THIS RANGE IS USED TO TRAIN AND FAMILIARIZE PERSONNEL ON THE SKILLS NECESSARY TO IDENTIFY, ENGAGE, AND HIT STATIONARY INFANTRY TARGETS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
17530	1753	S	AC		[FP]	RECORD FIRE RANGE	Y	A RECORD FIRE RANGE IS DESIGNED FOR TRAINING AND DAY/NIGHT QUALIFICATION REQUIREMENTS WITH RIFLES. THIS RANGE IS USED TO TRAIN AND TEST PERSONNEL ON THE SKILLS NECESSARY TO IDENTIFY, ENGAGE, AND HIT STATIONARY INFANTRY TARGETS.	
17531	1753	S	AC		[FP]	AUTO RECORD FIRE RANGE	Y	AN AUTOMATED RECORD FIRE RANGE IS DESIGNED FOR TRAINING AND DAY/NIGHT QUALIFICATION REQUIREMENTS WITH RIFLES. THIS RANGE IS USED TO TRAIN AND TEST PERSONNEL ON THE SKILLS NECESSARY TO IDENTIFY, ENGAGE, AND HIT STATIONARY INFANTRY TARGETS. ALL TARGETS ARE FULLY AUTOMATED AND THE EVENT SPECIFIC TARGET SCENARIO IS COMPUTER DRIVEN AND SCORED FROM THE RANGE OPERATIONS CENTER.	
17532	1753	S	AC		[FP]	MOD RECORD FIRE RANGE	Y	A MODIFIED RECORD FIRE RANGE IS DESIGNED FOR TRAINING AND DAY/NIGHT QUALIFICATION WITH RIFLES.	
17550	1755	S	AC		[FP]	RIFLE (KD) RANGE	Y	A RIFLE KNOWN DISTANCE RANGE IS DESIGNED FOR TRAINING RIFLE MARKSMANSHIP AND TARGET ENGAGEMENT TECHNIQUES. THIS RANGE IS USED TO TRAIN PERSONNEL ON THE SKILLS NECESSARY TO IDENTIFY, ENGAGE, AND HIT STATIONARY TARGETS IN A STATIC ARRAY FROM A KNOWN DISTANCE.	
17560	1756	S	AC		[FP]	SNIPER FIELD FIRE RANGE	Y	A SNIPER FIELD FIRE RANGE IS DESIGNED TO MEET TRAINING AND QUALIFICATION REQUIREMENTS WITH THE SNIPER RIFLE. THIS RANGE IS USED TO TRAIN AND TEST SNIPERS ON THE SKILLS NECESSARY TO DETECT, IDENTIFY, ENGAGE, AND HIT STATIONARY AND MOVING INFANTRY TARGETS IN A TACTICAL ARRAY IN ACCORDANCE WITH APPLICABLE FIELD MANUALS. IN THIS RANGE TARGETS ARE NOT FULLY AUTOMATED.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
17561	1756	S	AC		[FP]	AUTO SNIPER FLD FIRE RNG	Y		AN AUTOMATED SNIPER FIELD FIRE RANGE IS DESIGNED TO MEET THE TRAINING AND QUALIFICATION REQUIREMENTS WITH THE SNIPER RIFLE. THIS RANGE IS USED TO TRAIN AND TEST SNIPERS ON THE SKILLS NECESSARY TO DETECT, IDENTIFY, ENGAGE, AND HIT STATIONARY AND MOVING INFANTRY TARGETS IN A TACTICAL ARRAY IN ACCORDANCE WITH APPLICABLE FIELD MANUALS.
17570	1757	S	AC		[FP]	PISTOL (KD) RANGE	Y		A PISTOL KNOWN DISTANCE (KD) RANGE IS DESIGNED FOR TRAINING PISTOL AND REVOLVER MARKSMANSHIP AND TARGET ENGAGEMENT TECHNIQUES. THIS RANGE IS USED TO TRAIN PERSONNEL ON THE SKILLS NECESSARY TO IDENTIFY, ENGAGE, AND HIT STATIONARY TARGETS IN A STATIC ARRAY FROM A KNOWN DISTANCE.
17571	1757	S	AC		[FP]	COMBAT PISTOL QUAL CRSE	Y		A COMBAT PISTOL/MP FIREARMS QUALIFICATION COURSE IS A RANGE DESIGNED TO MEET TRAINING AND QUALIFICATION REQUIREMENTS WITH COMBAT PISTOLS AND REVOLVERS. THIS RANGE IS USED TO TRAIN AND TEST PERSONNEL ON THE SKILLS NECESSARY TO IDENTIFY, ENGAGE, AND HIT STATIONARY INFANTRY TARGETS.
17572	1757	S	AC		[FP]	AUTO COMBAT PSTL QUAL	Y		AN AUTOMATED COMBAT PISTOL/MP FIREARMS QUALIFICATION COURSE IS A RANGE DESIGNED TO MEET TRAINING AND QUALIFICATION REQUIREMENTS WITH COMBAT PISTOLS AND REVOLVERS. THIS RANGE IS USED TO TRAIN AND TEST PERSONNEL ON THE SKILLS NECESSARY TO IDENTIFY, ENGAGE, AND HIT STATIONARY INFANTRY TARGETS.
17573	1758	S	AC		[FP]	SUBMACHINE GUN RANGE	Y		A SUBMACHINE GUN RANGE IS DESIGNED FOR TRAINING TARGET ENGAGEMENT TECHNIQUES WITH THE SUBMACHINE GUN. THIS RANGE IS USED TO TRAIN PERSONNEL ON THE SKILLS NECESSARY TO IDENTIFY, ENGAGE, AND HIT STATIONARY INFANTRY TARGETS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17580	1758	S	AC		[FP]	MACHINE GUN TRANS RANGE	Y	A MACHINE GUN TRANSITION RANGE IS DESIGNED TO MEET THE TRAINING REQUIREMENTS WITH MACHINE GUNS. THIS RANGE IS USED TO TRAIN PERSONNEL ON THE SKILLS NECESSARY TO IDENTIFY, ENGAGE, AND HIT STATIONARY INFANTRY TARGETS AT KNOWN DISTANCES.	
17581	1758	S	AC		[FP]	MACHINE GUN FF RANGE	Y	A MACHINE GUN FIELD FIRE RANGE IS DESIGNED TO TRAIN TARGET ENGAGEMENT TECHNIQUES WITH SQUAD ASSAULT WEAPONS AND MACHINE GUNS. THIS RANGE IS USED TO TRAIN PERSONNEL ON THE SKILLS NECESSARY TO IDENTIFY, ENGAGE, AND HIT STATIONARY INFANTRY, VEHICLE, AND BUNKER TYPE TARGETS.	
17582	1758	S	AC		[FP]	AUTOMATED MPMG RANGE	Y	AN AUTOMATED MULTIPURPOSE MACHINE GUN (MPMG) RANGE IS DESIGNED FOR ZEROING, TRAINING, AND QUALIFICATION REQUIREMENTS WITH SQUAD ASSAULT WEAPONS (SAW) AND MACHINE GUNS. THIS RANGE IS USED TO TRAIN PERSONNEL ON THE SKILLS NECESSARY TO IDENTIFY, ENGAGE, AND HIT STATIONARY INFANTRY TARGETS.	
176						WEAPONS RANGES			
17610	1761	S	AC		[FP]	GRENADE LAUNCHER RANGE	Y	A GRENADE LAUNCHER RANGE IS DESIGNED TO MEET TRAINING AND QUALIFICATION REQUIREMENTS OF THE 40MM M203 GRENADE LAUNCHER. THIS RANGE IS USED TO TRAIN AND TEST PERSONNEL ON THE SKILLS NECESSARY TO ENGAGE AND DEFEAT STATIONARY TARGET EMPLACEMENTS WITH THE 40MM GRENADE LAUNCHER.	



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
17620	1762	S	AC	LN	[FP]	40MM QUALIFICATION RANGE	Y	A 40MM MACHINE GUN QUALIFICATION RANGE IS DESIGNED TO CONDUCT TRAINING QUALIFICATION FIRING WITH THE GRENADE MACHINE GUN (E.G., MK-19). THIS RANGE IS USED TO TRAIN PERSONNEL WITH THE WEAPON EITHER GROUND OR VEHICLE MOUNTED. TARGETS IN THIS RANGE MAY BE EITHER NON-AUTOMATED OR FULLY AUTOMATED AND THE EVENT SPECIFIC TARGET SCENARIO IS COMPUTER DRIVEN AND SCORED FROM THE RANGE OPERATIONS CENTER.
17630	1763	S	AC		[FP]	LAW RANGE SUBCALIBER	Y	A LIGHT ANTI-ARMOR WEAPONS RANGE IS DESIGNED FOR TRAINING TARGET ENGAGEMENT TECHNIQUES WITH LIGHT ANTI-ARMOR WEAPONS (E.G., LAW/AT-4). THIS RANGE IS USED TO TRAIN PERSONNEL ON THE SKILLS NECESSARY TO EMPLOY THE WEAPON AND HIT STATIONARY AND MOVING TARGETS USING A SUB-CALIBER TRAINING DEVICE.
17631	1763	S	AC		[FP]	LAW RANGE LIVE	Y	A LIGHT ANTI-ARMOR WEAPONS RANGE LIVE IS DESIGNED FOR TRAINING TARGET ENGAGEMENT TECHNIQUES WITH LIGHT ANTI-ARMOR WEAPONS (E.G., LAW/ AT-4). THIS RANGE IS USED TO TRAIN PERSONNEL ON THE SKILLS NECESSARY TO EMPLOY THE WEAPON AND HIT STATIONARY AND MOVING TARGETS USING LIVE ROCKETS OR A SUB-CALIBER TRAINING DEVICE.
17640	1764	S	AC	LN	[FP]	ANTIARMOR TRK/ FIRE RANGE	Y	AN ANTI-ARMOR TRACKING AND LIVE-FIRE RANGE IS A COMPLEX DESIGNED TO MEET TRAINING AND QUALIFICATION REQUIREMENTS WITH MEDIUM AND HEAVY ANTI-ARMOR WEAPONS SYSTEMS. THIS COMPLEX IS USED TO TRAIN AND TEST SOLDIERS ON THE SKILLS NECESSARY TO EMPLOY THE WEAPON, IDENTIFY, TRACK, ENGAGE, AND DEFEAT STATIONARY AND MOVING ARMOR TARGETS PRESENTED INDIVIDUALLY OR AS PART OF A TACTICAL ARRAY.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
17641	1764	S	AC	LN	[FP]	AUTO AA TRK/FIRE RANGE	Y		AN AUTOMATED ANTI-ARMOR TRACKING AND LIVE-FIRE RANGE IS A COMPLEX DESIGNED TO MEET TRAINING AND QUALIFICATION REQUIREMENTS WITH MEDIUM AND HEAVY ANTI-ARMOR WEAPONS SYSTEMS. THIS COMPLEX IS USED TO TRAIN AND TEST PERSONNEL ON THE SKILLS NECESSARY TO EMPLOY THE WEAPON, IDENTIFY, TRACK, ENGAGE, AND DEFEAT STATIONARY AND MOVING ARMOR TARGETS PRESENTED INDIVIDUALLY OR AS PART OF A TACTICAL ARRAY.
17650	1765	S	AC	[EA]	FP	F/A DIRECT FIRE RANGE	Y		A FIELD ARTILLERY DIRECT FIRE RANGE IS DESIGNED TO MEET TRAINING REQUIREMENTS OF FIELD ARTILLERY CREWS. THIS RANGE IS USED TO TRAIN FIELD ARTILLERY CREWS ON THE SKILLS NECESSARY TO EMPLOY DIRECT FIRE GUNNERY TECHNIQUES WITH INDIRECT FIRE EQUIPMENT AGAINST STATIONARY TARGETS IN A TACTICAL ARRAY USING LIVE DIRECT FIRE ARTILLERY.
17660	1766	S	AC	[EA]	FP	TANK/FTNG VEHICLE RANGE	Y		A TANK/FIGHTING VEHICLE STATIONARY GUNNERY RANGE IS DESIGNED FOR CONDUCTING WEAPONS SYSTEM BORE SIGHTING, SCREENING, ZEROING AND/OR HARMONIZATION. ARMOR, INFANTRY AND/OR AVIATION CREW USE THIS RANGE.
17670	1767	S	AC	[EA]	FP	MORTAR RANGE	N		A MORTAR RANGE IS DESIGNED TO MEET THE TRAINING REQUIREMENTS OF MORTAR CREWMEN. THIS RANGE IS USED TO TRAIN MORTAR CREWS ON THE SKILLS NECESSARY TO APPLY FIRE MISSION DATA, ENGAGE, AND HIT STATIONARY TARGETS IN A TACTICAL ARRAY USING LIVE FIRE MORTARS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17671	1767	S	AC	[EA]	FP	F/A INDIRECT FIRE RANGE	N	A FIELD ARTILLERY INDIRECT FIRE RANGE IS DESIGNED TO MEET THE TRAINING AND QUALIFICATION REQUIREMENTS OF FIELD ARTILLERY UNITS. THIS RANGE IS USED TO TRAIN FIELD ARTILLERY CREWS ON THE SKILLS NECESSARY TO APPLY FIRE MISSION DATA, ENGAGE, AND HIT STATIONARY TARGETS IN A TACTICAL ARRAY WITH INDIRECT FIRE.	
17680	1768	S	AC	[EA]	FP	MORTAR SCALED RANGE	Y	A MORTAR SCALED RANGE IS DESIGNED TO MEET THE TRAINING REQUIREMENTS OF MORTAR CREWMEN. THIS RANGE IS USED TO TRAIN MORTAR CREWS ON THE SKILLS NECESSARY TO APPLY FIRE MISSION DATA, ENGAGE, AND HIT STATIONARY TARGETS IN A TACTICAL ARRAY USING SUB-CALIBER TRAINING DEVICES.	
17681	1768	S	AC	[EA]	FP	F/A SCALED RANGE	Y	A FIELD ARTILLERY SCALED RANGE IS DESIGNED TO MEET TRAINING REQUIREMENTS OF FIELD ARTILLERY CREWS. THIS RANGE IS USED TO TRAIN FIELD ARTILLERY CREWS ON THE SKILLS NECESSARY TO APPLY FIRE MISSION DATA, ENGAGE, AND HIT STATIONARY TARGETS IN A TACTICAL ARRAY USING SUB-CALIBER TRAINING DEVICES.	
17690	1769	S	AC	[EA]	FP	SCALED RANGE (1:30/60)	Y	A SCALED GUNNERY RANGE (1:30 AND 1:60) IS DESIGNED TO MEET TRAINING REQUIREMENTS OF ARMOR CREWS. THIS RANGE IS USED TO TRAIN ARMOR CREWS ON THE SKILLS NECESSARY TO DETECT, IDENTIFY, ENGAGE, AND HIT STATIONARY AND MOVING SCALED TARGETS IN A TACTICAL ARRAY USING SUB-CALIBER TRAINING DEVICES.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
17691	1769	S	AC	[EA]	FP	SCALED RANGE (1:5/10)	Y	A SCALED GUNNERY RANGE (1:50 AND 1:10) IS DESIGNED TO MEET TRAINING REQUIREMENTS OF ARMOR AND INFANTRY CREWS. THIS RANGE IS USED TO TRAIN ARMOR AND INFANTRY CREWS ON THE SKILLS NECESSARY TO DETECT, IDENTIFY, ENGAGE, AND HIT STATIONARY AND MOVING SCALED TARGETS IN A TACTICAL ARRAY USING SUB-CALIBER TRAINING DEVICES AND/OR SIMULATIONS.	
177						TEAM AND UNIT RANGES			
17710	1771	S	AC	LN	[FP]	MULTIPURPOSE TRNG RANGE	Y	A MULTIPURPOSE TRAINING RANGE IS DESIGNED TO MEET THE TRAINING AND QUALIFICATION REQUIREMENTS FOR THE CREWS, TEAMS AND SECTIONS OF COMBAT UNITS. THIS RANGE IS USED TO TRAIN AND TEST ARMOR, INFANTRY, AND AVIATION CREWS AND SECTIONS ON THE SKILLS NECESSARY TO DETECT, IDENTIFY, ENGAGE, AND DEFEAT STATIONARY AND MOVING ARMOR AND INFANTRY TARGETS IN A TACTICAL ARRAY.	
17711	1771	S	AC	LN	[FP]	AUTO MP TRAINING RANGE	Y	AN AUTOMATED MULTIPURPOSE TRAINING RANGE IS SPECIFICALLY DESIGNED TO SATISFY THE TRAINING AND QUALIFICATION REQUIREMENTS FOR THE CREWS, TEAMS AND SECTIONS OF COMBAT UNITS. THIS RANGE SUPPORTS DISMOUNTED INFANTRY SQUAD TACTICAL LIVE-FIRE OPERATIONS EITHER INDEPENDENTLY OF, OR SIMULTANEOUSLY WITH SUPPORTING VEHICLES.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
17720	1772	S	AC	[EA]	FP	T/FV PLATOON BATTLE RUN	Y	A TANK/FIGHTING VEHICLE PLATOON BATTLE RUN IS DESIGNED TO MEET THE TRAINING AND QUALIFICATION REQUIREMENTS FOR PLATOONS OF ARMOR AND INFANTRY UNITS. THIS RANGE IS USED TO TRAIN AND TEST ARMOR AND INFANTRY PLATOONS AND SECTIONS ON THE SKILLS NECESSARY TO DETECT, IDENTIFY, ENGAGE, AND DEFEAT STATIONARY AND MOVING ARMOR AND INFANTRY TARGETS IN A TACTICAL ARRAY.	
17721	1772	S	AC	[EA]	FP	T/FV MP RANGE COMPLEX, LT	Y	A TANK/FIGHTING VEHICLE MULTIPURPOSE RANGE COMPLEX, LIGHT, AUTOMATED, IS DESIGNED TO MEET THE TRAINING AND QUALIFICATION REQUIREMENTS FOR LIGHT AND MECHANIZED INFANTRY, ARMOR, AND AVIATION UNITS. IT IS USED TO TRAIN AND TEST INFANTRY, ARMOR, AND AVIATION TEAMS AND CREWS ON THE SKILLS NECESSARY TO DETECT, IDENTIFY, ENGAGE, AND DEFEAT STATIONARY AND MOVING ARMOR AND INFANTRY TARGETS.	
17722	1772	S	AC	[EA]	FP	T/FV MP RANGE COMPLEX, HV	Y	A TANK/FIGHTING VEHICLE MULTIPURPOSE RANGE COMPLEX, HEAVY, AUTOMATED, IS DESIGNED FOR TRAINING AND QUALIFICATION REQUIREMENTS FOR THE CREWS OF ARMOR, INFANTRY AND AVIATION UNITS. IT SUPPORTS INFANTRY SQUAD TACTICAL LIVE-FIRE OPERATIONS. IT IS USED TO TRAIN AND TEST ARMOR, INFANTRY, AND AVIATION TEAMS ON THE SKILLS TO DETECT, IDENTIFY, AND DEFEAT STATIONARY AND MOVING ARMOR AND INFANTRY TARGETS.	
17730	1773	S	AC	LN	[FP]	FIRE AND MOVEMENT RANGE	Y	A FIRE AND MOVEMENT RANGE IS DESIGNED FOR TRAINING INDIVIDUAL AND BUDDY/TEAM FIRE AND MOVEMENT TECHNIQUES. THE TEAM NEGOTIATES MANEUVER UTILIZING COVER AND CONCEALMENT TECHNIQUES.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
17740	1774	S	AC	[EA]	FP	SQUAD DEFENSE RANGE	Y	A SQUAD DEFENSE RANGE IS DESIGNED FOR TRAINING INDIVIDUALS AND SQUADS ON DEFENSIVE ENGAGEMENT TECHNIQUES AND MUTUALLY SUPPORTING FIRES. THIS RANGE IS USED TO TRAIN PERSONNEL ON THE SKILLS NECESSARY TO DESIGNATE SECTORS OF FIRE, IDENTIFY, AND PROVIDE SUPPRESSIVE FIRE ON STATIONARY INFANTRY TARGETS.	
17750	1775	S	AC	[EA]	FP	INF SQUAD BATTLE COURSE	Y	AN INFANTRY SQUAD BATTLE COURSE IS FOR THE TRAINING AND QUALIFICATION REQUIREMENTS OF TEAMS AND SQUADS ON INDIVIDUAL AND COLLECTIVE TACTICS, TECHNIQUES, AND PROCEDURES AND EMPLOYMENT IN TACTICAL SITUATIONS. IT IS USED TO TRAIN AND TEST TEAMS AND SQUADS ON THE SKILLS NECESSARY TO CONDUCT TACTICAL MOVEMENT TECHNIQUES, DETECT, IDENTIFY, AND DEFEAT STATIONARY AND MOVING ARMOR AND INFANTRY TARGETS.	
17751	1775	S	AC	[EA]	FP	AUTO INF SQD BAT COURSE	Y	AN AUTOMATED INFANTRY SQUAD BATTLE COURSE IS DESIGNED FOR TRAINING AND QUALIFICATION REQUIREMENTS OF TEAMS AND SQUADS ON INDIVIDUAL AND COLLECTIVE TACTICS, TECHNIQUES AND PROCEDURES AND EMPLOYMENT IN TACTICAL SITUATIONS. IT IS USED TO TRAIN AND TEST TEAMS AND SQUADS ON THE SKILLS TO CONDUCT TACTICAL MOVEMENT TECHNIQUES, DETECT, IDENTIFY, AND DEFEAT STATIONARY AND MOVING ARMOR AND INFANTRY TARGETS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17752	1775	S	AC	[EA]	FP	INF PLATOON BAT COURSE	Y	AN INFANTRY PLATOON BATTLE COURSE IS DESIGNED FOR THE TRAINING AND QUALIFICATION REQUIREMENTS OF INFANTRY PLATOONS, EITHER MOUNTED OR DISMOUNTED, ON MOVEMENT TECHNIQUES AND OPERATIONS. THIS COMPLEX IS USED TO TRAIN AND TEST PLATOONS ON THE SKILLS NECESSARY TO CONDUCT TACTICAL MOVEMENT TECHNIQUES, DETECT, IDENTIFY, ENGAGE, AND DEFEAT STATIONARY AND MOVING ARMOR AND INFANTRY TARGETS.	
17753	1775	S	AC	[EA]	FP	AUTO INF PLTN BAT COURSE	Y	AN AUTOMATED INFANTRY PLATOON BATTLE COURSE IS DESIGNED FOR THE TRAINING AND QUALIFICATION REQUIREMENTS OF INFANTRY PLATOONS, EITHER MOUNTED OR DISMOUNTED, ON MOVEMENT TECHNIQUES AND OPERATIONS. THIS COMPLEX IS USED TO TRAIN AND TEST PLATOONS ON THE SKILLS TO CONDUCT TACTICAL MOVEMENT TECHNIQUES, DETECT, IDENTIFY, ENGAGE, AND DEFEAT STATIONARY AND MOVING ARMOR AND INFANTRY TARGETS.	
17760	1776	S	AC	[EA]	FP	MOUT ASSAULT COURSE	Y	A MOUT ASSAULT COURSE IS A FACILITY FOR LOW-LEVEL COLLECTIVE TRAINING USING LIVE FIRE OR MILES. THIS FACILITY IS USED FOR TRAINING SPECIFIC TASKS BEFORE TRAINING ON UNIT PROFICIENCY MOUT SITES OR COMBAT IN CITIES FACILITY, CARRIED UNDER CATEGORY CODE 179 61.	
178						EXPLOSIVE AND FLAME RANGES			
17810	1781	S	AC		[FP]	LIVE HAND GRENADE RANGE	Y	A LIVE HAND GRENADE RANGE IS DESIGNED TO SATISFY THE TRAINING REQUIREMENT OF THROWING LIVE FRAGMENTATION GRENADES. THIS RANGE FAMILIARIZES SOLDIERS WITH THE EFFECTS OF LIVE FRAGMENTATION GRENADES.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
17820	1782	S	AC		[FP]	ENGR QUALF RANGE, N/STD	Y	AN ENGINEER QUALIFICATION RANGE, NON-STANDARDIZED, IS DESIGNED TO MEET THE TRAINING AND QUALIFICATION REQUIREMENTS FOR ENGINEER AND COMBAT ENGINEER CREWS. THIS RANGE IS USED TO TRAIN AND TEST ENGINEER CREWS ON THE SKILLS NECESSARY TO ZERO AND/OR BORESIGHT WEAPONS SYSTEMS, IDENTIFY, CLASSIFY, AND REDUCE OBSTACLES.
17821	1782	S	AC		[FP]	ENGR QUAL RANGE, AUTO	Y	AN ENGINEER QUALIFICATION RANGE, AUTOMATED/STANDARDIZED, IS DESIGNED FOR THE TRAINING AND QUALIFICATION REQUIREMENTS OF ENGINEER AND COMBAT ENGINEER CREWS. THIS RANGE IS USED TO TRAIN AND TEST ENGINEER CREWS ON THE SKILLS NECESSARY TO ZERO AND / OR BORESIGHT WEAPONS SYSTEMS, IDENTIFY, CLASSIFY, AND REDUCE OBSTACLES.
17830	1783	S	AC		[FP]	LIGHT DEMOLITION RANGE	Y	A LIGHT DEMOLITION RANGE IS DESIGNED FOR THE TRAINING AND QUALIFICATION OF EMPLOYING EXPLOSIVES AND DEMOLITION CHARGES. THIS RANGE IS USED TO TRAIN PERSONNEL ON THE PROPER TECHNIQUES OF WIRE, MINEFIELD AND CONCRETE OBSTACLE BREACHING, TIMBER AND STEEL CUTTING, ROAD CRATERING, AND EXPLOSIVE DEMOLITION.

179 TRAINING FAC-OTHER  
THAN BLDG

This basic category includes requirements for weapons ranges, training courses and mockups, training pools/tanks, and parade and drill fields, but it does not include expendable targets.

17901	1799	S	AC	[EA]	FP	BAYONET ASSAULT COURSE	Y	A BAYONET ASSAULT COURSE IS DESIGNED FOR TRAINING ASSAULT TECHNIQUES WITH A RIFLE AND BAYONET. THESE TECHNIQUES ARE APPLIED THROUGH A SERIES OF OBSTACLES.
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## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
17902	1790	S		[EA]		(TD) RANGE, NON-FIRING	Y	A TARGET DETECTION RANGE, NON-FIRING, IS A NON-FIRING RANGE TO TEACH SOLDIERS HOW TO DETECT PERSONNEL ON THE BATTLEFIELD UNDER VARYING DEGREES OF CONCEALMENT AND VISIBILITY.	
17903	1799	S		[EA]		HAND TO HAND COMBAT PIT	Y	A HAND TO HAND COMBAT PIT IS A STRUCTURE CONTAINING A CIRCLE OF SAND OR SAWDUST FOR TRAINING IN HAND-TO-HAND FIGHTING.	
17904	1790	S		[EA]		POW TRAINING AREA	Y	A PRISONER OF WAR TRAINING AREA IS TYPICALLY AND AREA FENCED IN WITH BARBED WIRE AND WITH GUARD TOWERS USED FOR THE TRAINING OF PERSONNEL IN THE HANDLING OF PRISONERS-OF-WAR. THE FACILITY MAY ALSO BE USED FOR THE TRAINING OF PERSONNEL IN A SIMULATED POW ENVIRONMENT.	
17905	1776	S	AC	[EA]		MINE WARFARE AREA	Y	A MINE WARFARE AREA IS A CLEARED AREA FOR TRAINING IN THE PLACEMENT, ARMING, DISARMING, AND DETECTION OF VEHICLE AND ANTI-PERSONNEL MINES USING NON-EXPLOSIVE TRAINING MATERIAL.	
17906	1741	S	AC	[EA]		WHEEL VEH DRIVER COURSE	Y	A WHEELED VEHICLE DRIVERS COURSE IS FOR TEACHING BASIC DRIVING SKILLS, AND FOR PRACTICE IN FOUR-WHEEL DRIVE SITUATIONS, PARKING, AND BACKING UP.	
17907	1742	S	AC	[EA]		TRACK VEH DRIVER COURSE	Y	A TRACKED VEHICLE DRIVERS COURSE IS AN AREA TO TEACH THE BASIC DRIVING SKILLS OF STEERING AND GEAR SHIFTING ON A LEVEL COURSE. THE FACILITY MAY ALSO CONTAIN A HILLY COURSE FOR DEVELOPING ADVANCED TRACKED VEHICLE DRIVING SKILLS SUCH AS TURNING ON SLOPES AND NEGOTIATING STEEP GRADES.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17908	1742	S	AC	[EA]		AMPH VEH TRAINING AREA	Y	AN AMPHIBIOUS VEHICLE TRAINING AREA CONTAINS SAND OR IS CLOSE TO A BEACH FOR TRAINING MILITARY PERSONNEL ON UNIQUE DRIVING, TECHNICAL AND TACTICAL TASKS ASSOCIATED WITH AMPHIBIOUS OPERATIONS.	
17909	1790	S		[EA]		SHIP LOAD/UNLOAD MOCKUP	Y	A MOCKUP OF A SHIP USED FOR TRAINING PERSONNEL IN SHIP LOADING AND OFF-LOADING. TRAINING AREA CAN ALSO INCLUDE NEGOTIATING CARGO NETS USED DURING AMPHIBIOUS OPERATIONS AND OPERATIONS AT DOCKSIDE.	
17910	1793	S		[EA]		ACFT GUN BOMB ROCKET RNGES	N	AIRCRAFT GUNNERY, BOMBING AND ROCKET RANGES (AIRCRAFT WEAPONS RANGES) PROVIDE AIR CREWS WITH OPERATING AREAS FOR THE DEVELOPMENT OF PROFICIENCY IN GUNNERY, BOMBING, ROCKETRY, MISSILE DELIVERY, STRAFING, AND MINE LAYING.	
17911	1790	S		[EA]		AIR TRANSPORT MOCKUP	Y	AN AIR TRANSPORT MOCKUP IS A RAMP AND A PLATFORM STRUCTURE USED TO SIMULATE VARYING TYPES OF FIXED- AND ROTARY-WING AIRCRAFT. STRUCTURE ALLOWS LOADING, SECURING, AND UNLOADING OF VEHICLES, EQUIPMENT, AND/OR PERSONNEL.	
17912	1734	S		[EA]		TRNG TOWER/PLATFORM	Y	A STRUCTURE THAT SUPPORTS VARIOUS TRAINING SCENARIOS, INCLUDING USES SUCH AS PARACHUTE LANDING PLATFORMS, SUSPENDED HARNESS MOCKUPS, AND MOCK JUMP TOWERS.	
17916	1790	S	AC	[EA]		COMBAT TRAIL	Y	A COMBAT TRAIL IS A TRAINING SITE USED FOR VARIOUS TYPES OF PROFICIENCY AND SUSTAINMENT TRAINING BY ROTATION THROUGH DIFFERENT STATIONS IN A ROUND-ROBIN SCENARIO.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17917	1790	S		[EA]		RAPPELLING TRAINING AREA	Y	A RAPPELLING TRAINING AREA IS AN AREA THAT INCLUDES AT LEAST ONE STRUCTURE USED TO PRACTICE RAPPELLING (ROPE DESCENT). THE TRAINING AREA MAY ALSO INCLUDE MODIFIED TOWERS FOR TRAINING IN HELICOPTER RAPPELS.	
17918	1111	LS	AC	[EA]		AIRFIELD DEMO RANGE	Y	AN EXPEDITIONARY TRAINING AREA COMPRISED OF CONSTRUCTED RUNWAY SURFACES THAT ARE INTENTIONALLY DAMAGED, THEN REPAIRED BY EXPEDITIONARY FORCES IN AN EFFORT TO INCREASE EXPEDIENCY OF REPAIRS DAMAGED IN THEATER BY INSURGENTS USING IEDS AND OTHER MEANS.	
17919	1790	S		[EA]		TIMBER BRIDGE AREA	Y	A TIMBER BRIDGE AREA IS A CLEARED AREA BESIDE A DITCH OR RAVINE FOR ENGINEER UNITS TO PRACTICE BUILDING TIMBER BRIDGES.	
17920	1790	S		[EA]		PANEL BRIDGE AREA	Y	A PANEL BRIDGE AREA IS A CLEARED AREA BESIDE A CREEK OR RAVINE FOR ENGINEER UNITS TO PRACTICE BUILDING PANEL BRIDGES.	
17921	1790	S		[EA]		ARMORED VEH LAUNCH AREA	Y	AN ARMORED VEHICLE LAUNCH BRIDGE, RAFT, AND FORD AREA IS A CLEARED PIECE OF LAND BESIDE A CREEK OR RAVINE USED FOR ERECTION AND RETRIEVAL OF ARMORED VEHICLE LAUNCH BRIDGES (AVLB) AND SCISSOR BRIDGES.	
17922	1790	S		[EA]		FLOATING BRIDGE SITE	Y	A FLOATING BRIDGE SITE IS A CLEARED RIVERBANK AREA FOR ENGINEER UNITS TO PRACTICE FORDING WATER OBSTACLES AND ERECTION AND RETRIEVAL OF FLOATING BRIDGING EQUIPMENT.	
17924	1742	S	AC	[EA]		WATER SUPPLY TRNG AREA	Y	A WATER SUPPLY TRAINING AREA IS PARTIALLY IMPROVED LAND FOR PERFORMING WATER PURIFICATION AND STORAGE OPERATIONS. IT SHOULD BE LOCATED ON A FLOWING STREAM WITH FIRM BANKS AND ALL-WEATHER ACCESS ROADS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
17925	1742	S	AC	[EA]		AFLD SITE SEL TRNG AREA	Y	AN AIRFIELD SITE SELECTION TRAINING AREA IS CLEARED LAND USED TO TRAIN SOLDIERS IN THE FUNDAMENTALS OF SELECTING AND SECURING A SITE SUITABLE FOR TAKEOFFS AND PARKING OF ROTARY-WING AIRCRAFT.
17926	1792	S	AC	[EA]		AERIAL GUNNERY RANGE	Y	AN AERIAL GUNNERY RANGE IS DESIGNED TO SUPPORT THE TRAINING AND QUALIFICATION REQUIREMENTS OF HELICOPTER GUNNERY. THIS RANGE IS USED TO TRAIN AND TEST HELICOPTER CREWS ON THE SKILLS NECESSARY TO DETECT, IDENTIFY, ENGAGE, AND HIT STATIONARY ARMOR AND INFANTRY TARGETS IN A TACTICAL ARRAY.
17930	1767	S		[EA]		SURFACE PROJECTILE RANGE	N	THIS CODE IS FOR RANGES SUPPORTING SURFACE-LAUNCHED PROJECTILES AS OPPOSED TO RANGES FOR AIR-LAUNCHED PROJECTILES WHICH ARE CODED AS CATEGORY CODE 179 10. CRITERIA ARE NOT PRESENTLY AVAILABLE FOR SURFACE PROJECTILE RANGE REQUIREMENTS.
17931	1742	S	AC	[EA]		MED HVY EQUIP TRNG AREA	Y	A MEDIUM HEAVY EQUIPMENT TRAINING AREA IS AN UNIMPROVED AREA FOR TRAINING IN PLACEMENT, COMPACTION, AND GRADING OF FILL, AND TRAINING IN CONSTRUCTION OF DRAINAGE STRUCTURES.
17932	1790	S	AC	[EA]		DECON TRAINING SITE	Y	A DECONTAMINATION TRAINING SITE IS AN AREA CONSISTING OF A PIT FILLED WITH ROCK WITH AN ATTACHED ROCK-FILLED SUMP TO A DRAIN BED. THIS STRUCTURE IS USED PRIMARILY FOR VEHICLE DECONTAMINATION TRAINING.
17933	1790	S	AC	[EA]		POL TRAINING AREA	Y	A POL TRAINING AREA IS A MATERIALS HANDLING AREA FOR TRAINING PERSONNEL IN THE PROPER HANDLING OF PETROLEUM, OILS, AND LUBRICANTS. ALSO USED FOR ASSEMBLY AND TRAINING IN VARIOUS POL STORAGE AND DISTRIBUTION SYSTEMS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17935	1734	S		[EA]		WEAPONS RANGE OPS TOWER	N	RANGE OPERATIONS TOWERS ARE USED AT GUNNERY, BOMBING, AND ROCKET RANGES TO PROVIDE AN UNOBSTRUCTED VIEW OF TARGET AREAS FOR PURPOSES OF CONTROL AND SPOTTING IMPACTS.	
17936	1793	S	AC	[EA]		CLOSE AIR SUPPORT RANGE	N	A CLOSE AIR SUPPORT RANGE IS DESIGNED TO SUPPORT THE TRAINING AND QUALIFICATION REQUIREMENTS OF CLOSE AIR SUPPORT AIRCRAFT. THIS RANGE IS USED TO TRAIN AND TEST AIRCRAFT CREWS ON THE SKILLS NECESSARY TO PROVIDE AIR SUPPORT TO GROUND FORCES UNDER VARYING CONDITIONS.	
17937	1793	S	AC	[EA]		AERIAL BOMBING RANGE	N	AN AERIAL BOMBING RANGE IS DESIGNED TO SUPPORT THE TRAINING AND QUALIFICATION REQUIREMENTS FOR FIXED-WING AIRCRAFT DROPPING THEIR ORDNANCE. THIS RANGE IS USED TO TRAIN AND TEST AIRCRAFT CREWS ON THE SKILLS NECESSARY TO DETECT AND SUPPRESS ENEMY TARGETS IN A TACTICAL ARRAY.	
17940	1750	S		[EA]	FP	SMALL ARMS RANGE - OUTDOOR	Y	A SMALL ARMS RANGE PROVIDES AN AREA FOR TRAINING IN THE USE OF PISTOLS, SMALL CALIBER RIFLES, AND SMALL CALIBER MACHINE GUNS. RANGES MUST BE AVAILABLE ALL YEAR TO PROVIDE CONTINUAL TRAINING AND RETRAINING FOR PERSONNEL WHO MUST BE PROFICIENT IN THE USE OF SMALL ARMS.	
17941	1794	S	AC		[FP]	AIR DEF MISSILE FRNG RANGE	Y	AN AIR DEFENSE MISSILE FIRING RANGE IS DESIGNED TO MEET TRAINING AND QUALIFICATION REQUIREMENTS OF AIR DEFENSE (LAAD/STINGER) UNITS. THIS RANGE IS USED TO TRAIN AND TEST CREWS ON THE SKILLS NECESSARY TO EMPLOY GROUND TO AIR ANTI-AIRCRAFT MISSILES AGAINST BALLISTIC AERIAL TARGET SYSTEMS (BATS).	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17945	1790	S		[EA]		TRAINING MOCK- UPS	Y	THIS CODE INCLUDES MOCKUP STRUCTURES REPRESENTING ALL OR PARTS OF SHIPS, AIRCRAFT, TANKS, OR BUILDINGS FOR TRAINING PERSONNEL IN SKILLS SUCH AS DISASTER CONTROL, FIRE FIGHTING, AND EQUIPMENT HANDLING.	
17950	1741	S	AC	[EA]		TRAINING COURSE	N	THIS CODE INCLUDES AREAS DESIGNATED FOR PERSONNEL TRAINING IN VARIOUS SKILLS UNDER ACTUAL OPERATIONAL CONDITIONS. TABLE 17950-1 OUTLINES THE FACILITIES OF THIS GROUP AND APPROXIMATE REQUIREMENTS.	
17951	1795	S	AC	[EA]		FF AND RESCUE TRNG AREA	Y	A FIRE FIGHTING AND RESCUE TRAINING AREA IS A STRUCTURE CONSISTING OF A MOCKUP OF A MULTISTORY BUILDING OR AN AIRCRAFT FOR TRAINING IN FIRE CONTAINMENT, LADDER USE, ESCAPE, AND RESCUE FROM BUILDINGS.	
17955	1725	S		[EA]	ME	COMBAT TRAIN'G POOL/TANK	Y	A COMBAT TRAINING POOL/TANK IS PLANNED FOR INSTRUCTIONS IN SWIMMING AND SURVIVAL UNDER COMBAT CONDITIONS. THE SWIMMING POOL/TANK MAY BE PROVIDED ONLY AS REQUIRED FOR TRAINING PURPOSES,	
17960	1745	S	AC	[EA]		PARADE AND DRILL FIELD	N	THIS FACILITY PROVIDES SPACE FOR FORMATION DRILLS, PARADE AND REVIEW FUNCTIONS, AND HONOR CEREMONIES. SUCH A FIELD MAY BE PLANNED FOR STATIONS HAVING INDEPENDENT COMMAND FUNCTIONS.	
17961	1790	S	AC	[EA]		COMBAT IN CITIES FACILITY	Y	A COMBAT IN CITIES FACILITY IS A NON-STANDARD TRAINING FACILITY THAT TYPICALLY INCLUDES THE BUILDINGS, ROADS, AND SIDEWALKS NORMALLY FOUND IN AN URBAN ENVIRONMENT, AND WHICH IS USED TO TRAIN AND SUSTAIN UNIT PROFICIENCY IN AN URBAN ENVIRONMENT.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17962	1790	S	AC	[EA]		MOUT COLLECTIVE(SMALL )	Y	A MOUT COLLECTIVE TRAINING FACILITY (SMALL) IS DESIGNED TO MEET THE TRAINING REQUIREMENTS OF AN INFANTRY COMPANY-SIZED UNIT IN AN URBAN ENVIRONMENT. THIS STRUCTURE CONTAINS 24 BUILDINGS OR LESS AND IS USED TO TRAIN UNIT COLLECTIVE TASKS ASSOCIATED WITH URBAN TERRAIN.	
17963	1796	S	SF	[EA]		MOUT COLLECTIVE (LARGE)	Y	A MOUT COLLECTIVE TRAINING FACILITY (LARGE) IS DESIGNED TO MEET THE TRAINING REQUIREMENTS OF AN INFANTRY BATTALION-SIZED UNIT IN AN URBAN ENVIRONMENT. THIS STRUCTURE CONTAINS MORE THAN 24 BUILDINGS AND IS USED TO TRAIN UNIT COLLECTIVE TASKS ASSOCIATED WITH URBAN TERRAIN.	
17970	1790	S		[EA]		RADAR BOMB SCORING RANGE	N	A RADAR BOMB SCORING FACILITY (RBS) IS USED TO MEASURE, ELECTRONICALLY, AIRCRAFT SIMULATED-BOMBING RESULTS AND TO PRODUCE GRAPHIC FLIGHT PATH TRACKING DATA AND OTHER PERTINENT AIRCRAFT TARGET SCORING INFORMATION.	
17971	1790	S		[EA]		ELECTRONIC WAR TRNG RNGE	N	TRAINING RANGE FOR USING REMOTE CONTROLLED EQUIPMENT SUCH AS ROBOTS FOR EOD TRAINING.	
17972	1790	S		[EA]		UNDWTR TRACKG/TRNG RNGE	Y	THE UNDERWATER TRACKING RANGE IS USED TO SUPPORT SURFACE AND SUBSURFACE WEAPON SYSTEM ACCURACY TRIALS AND DEVELOPMENT, TEST, AND EVALUATION PROJECTS. PLANNING FACTORS, STANDARDS, AND GUIDES FOR COMPUTING REQUIREMENTS FOR FACILITIES UNDER THIS CATEGORY ARE EXCLUDED FROM THIS PUB BECAUSE OF THE SPECIAL PROVISIONS AND VARIANCES IN THE APPLICATION OF CRITERIA FOR PLANNING UNDERWATER TRACKING RANGES.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
17981	1798	S	AC	[EA]	FP	INFILTRATION COURSE	Y	AN INFILTRATION COURSE IS DESIGNED FOR TRAINING INDIVIDUAL INFILTRATION AND COMBAT MOVEMENT TECHNIQUES AND THEN EXECUTING THEM WHILE SUBJECT TO LIVE FIRE.	
17991	1799	S	AC	[EA]		CONFIDENCE COURSE	Y	A CONFIDENCE COURSE IS DESIGNED FOR DEVELOPING INDIVIDUAL SOLDIER CONFIDENCE AND STRENGTH THROUGH A SERIES OF OBSTACLES. NO AUTOMATION IS REQUIRED FOR THIS FACILITY.	
17992	1799	S	AC	[EA]		OBSTACLE COURSE	Y	AN OBSTACLE COURSE IS A FACILITY CONTAINING NUMEROUS OBSTACLES DESIGNED FOR DEVELOPING AND MEASURING INDIVIDUAL SOLDIER SPEED, AGILITY, AND COORDINATION UTILIZING VARIOUS OBSTACLES IN AN EFFORT TO REACH THE OBJECTIVE.	
200						MAINT AND PRODUCTION FAC			
210						MAINTENANCE FACILITIES			
211						MAINTENANCE- AIRCRAFT			
Facilities for the maintenance and repair of Navy and Marine Corps aircraft and related spares, including airframes, aircraft engines, aircraft weapons systems, avionics systems, and other related aircraft equipment.									
21101	2114	B	[SF]	EA		AIRCRAFT ENGINE TEST BLDG	Y	A BUILDING OR UTILIZATION IN A BUILDING USED AS AN ENGINE TEST CELL FOR EITHER IN-FRAME OR OUT-OF-FRAME ENGINE TESTING. SOMETIMES REFERRED TO AS A "HUSH HOUSE."	
21103	2113	B	[SF]			CORROSION CONTROL HANGAR	Y	THIS HANGAR PROVIDES SPACE FOR WASHING, RINSING, PAINT STRIPPING, CORROSION REMOVAL, PROTECTIVE COATING AND PAINTING OF AIRCRAFT AT THE INTERMEDIATE AND ORGANIZATIONAL MAINTENANCE LEVELS.	



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21104	2111	B	[SF]			PRE-ENGIN MAINTENCE HANGAR	Y	THIS PRE-ENGINEERED MAINTENANCE HANGAR PROVIDES A FACILITY FOR AN ORGANIZATIONAL LEVEL MAINTENANCE OF NAVY AND MARINE CORPS AIRCRAFT. ITS INTENDED USE IS PRIMARILY AT OVERSEAS LOCATIONS FOR THE SUPPORT OF A DETACHMENT SIZE UNIT OF FROM THREE TO FIVE AIRCRAFT.	
21105	2111	B	[SF]			MAINT HANGAR-O/H SPACE	Y	MAINTENANCE HANGARS ARE REQUIRED TO PROVIDE WEATHER-PROTECTED SHELTER FOR THE SERVICING AND REPAIR OF NAVY AND MARINE CORPS AIRCRAFT AT THE ORGANIZATIONAL LEVEL AND EMERGENCY SHELTER FOR OPERABLE AIRCRAFT.	
21106	2112	B	[SF]			MAINT HANGAR-01 SPACE	Y	(01) IN ADDITION TO PROVIDING A WEATHER-PROTECTED SHELTER FOR THE SERVICING AND REPAIR OF NAVY AND MARINE CORPS AIRCRAFT AT THE ORGANIZATIONAL LEVEL AND EMERGENCY SHELTER FOR OPERABLE AIRCRAFT, IT ALSO CONTAINS SPACE FOR CREW AND EQUIPMENT.	
21107	6100	B	[SF]			MAINT HANGAR-02 SPACE	Y	(02) IN ADDITION TO PROVIDING A WEATHER-PROTECTED SHELTER FOR THE SERVICING AND REPAIR OF NAVY AND MARINE CORPS AIRCRAFT AT THE ORGANIZATIONAL LEVEL AND EMERGENCY SHELTER FOR OPERABLE AIRCRAFT, IT ALSO CONTAINS ADMINISTRATIVE SPACE.	
21108	2112	B	[SF]			AIRFRAMES SHOP (NON-DEPOT)	Y	AN INTERMEDIATE MAINTENANCE LEVEL IS REQUIRED AT NAVY AND MARINE CORPS AIR INSTALLATIONS FOR THE TESTING, MAINTENANCE AND REPAIR OF AIRFRAMES COMPONENTS. THIS SECTION PROVIDES THE METHOD FOR DETERMINING THE SPACE REQUIREMENTS FOR THIS DIVISION. THE PRIMARY FUNCTION OF THE AIRFRAMES SHOP IS TO REPAIR AIRCRAFT BOTH STRUCTURAL AND HYDRAULIC.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21109	1791	S	[EA]			AIRCRAFT BORESIGHT RANGE	Y	ONE AIRCRAFT BORESIGHT RANGE IS REQUIRED AT NAVY AND MARINE CORPS AIR INSTALLATIONS THAT SERVICE AIRCRAFT EQUIPPED WITH FIXED GUNS OR GUN PODS. A TAXIWAY, CATEGORY CODE 112 10 IS REQUIRED FOR ACCESS TO THIS FACILITY. AN AIRCRAFT PARKING APRON WITH TIE-DOWNS, CATEGORY CODE 113 20 IS REQUIRED TO PARK AND SECURE THE AIRCRAFT DURING GUN ALIGNMENT.	
21110	2116	B	[SF]			A/C OVERHAUL & REPAIR SHOP	Y	AN AIRCRAFT OVERHAUL AND REPAIR SHOP IS REQUIRED FOR THE AIRFRAME PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). THERE ARE GENERALLY TWO TYPES OF AIRCRAFT OVERHAUL AND REPAIR SHOPS. ONE SUPPORTS AIRCRAFT OVERHAUL AND REPAIR OF TRAINER AIRCRAFT, FIGHTER AIRCRAFT, AND HELICOPTERS AND ONE SUPPORTS AIRCRAFT OVERHAUL AND REPAIR OF CARGO, TRANSPORT, AND PATROL AIRCRAFT.	
21111	2116	B	[SF]			COROSION CONTRL- CLEAN SHOP	Y	THIS SHOP IS REQUIRED TO PROVIDE SPACE FOR AIRCRAFT CORROSION CONTROL AND DECONTAMINATION FACILITIES DESIGNED FOR CLEANING, PAINT STRIPPING, ETC., OF THE COMPLETE AIRCRAFT FOR THE AIRFRAME PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT).	
21112	2116	B	[SF]			PAINT & FINISHING HANGAR	Y	THIS HANGER IS REQUIRED FOR THE AIRFRAME PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). THIS FACILITY PROVIDES SPACE TO REPAINT AN ENTIRE AIRCRAFT.	
21113	2116	B	[SF]			A/C NON-DESTRUCT TEST SHP	Y	THIS SHOP IS REQUIRED TO PROVIDE SPACE FOR THE NON-DESTRUCTIVE INSPECTION OF AIRFRAMES FOR THE AIRFRAME PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT).	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21114	2116	B	[SF]			AIRCRAFT REWORK SHOP	Y	THIS IS THE AIRFRAME PRODUCTION SHOP OF THE NAVAL AIR DEPOT, WHICH INCLUDES AN AIRFRAME DEDICATED MACHINE SHOP, WELDING SHOP, PLATING SHOP, EXAMINATION AND EVALUATION, PRE-SHOP ANALYSIS, EXAMINATION AND INSPECTION SHOP, MAINTENANCE DOCK, QUICK ENGINE CHANGE SHOP ; (USED FOR QUICK ENGINE CHANGE AND ENGINE BUILD-UP INCLUDING DIESEL AND RESEAL OPERATIONS AND FUEL SYSTEMS MAINTENANCE FACILITIES).	
21115	2112	B	[SF]			LINE MAINTENANCE SHELTER	N	LINE MAINTENANCE SHELTERS ARE REQUIRED IN SUPPORT OF AIRCRAFT LOCATED ON AIRCRAFT PARKING APRONS AND AT AIRCRAFT BORESIGHT RANGES (CATEGORY CODE 21109).	
21116	2116	B	[SF]			AC INTERM MAINT MGMT	Y	FACILITY FOR THE CONTROL, MONITORING, AND ADMINISTRATION OF THE INTERMEDIATE MAINTENANCE ACTIVITY (IMA). IT INCLUDES ADMINISTRATION AND SUPERVISION OF THE MAINTENANCE; PRODUCTION, QUALITY, AND MATERIAL CONTROL, FINANCIAL ACCOUNTING, TRAINING, PERSONNEL, ADMINISTRATION, TECHNICAL PUBLICATIONS LIBRARY, DATA ANALYSIS, AND TOOL CONTROL FOR COMMON AND SPECIAL TOOLS AND TEST EQUIPMENT.	
21117	2116	B	[SF]			REG AC SERVICE FAC	Y	FACILITY PROVIDES SPACE TO PERFORM AIRCRAFT IN-SERVICE REPAIR (ISR), INTEGRATED MAINTENANCE (IMC/IMP), MODIFICATIONS (MOD) AND OTHER PROGRAM WORK THAT MAY CONCURRENTLY INVOLVE DEPOT, INTERMEDIATE, AND ORGANIZATIONAL LEVEL WORK ON AIRCRAFT BY SQUADRON, IMA, NAVAL AIR DEPOT (NAVAIR DEPOT), AND/OR CONTRACTOR PERSONNEL.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
21120	2116	B	[SF]			A/C ENGINE OVERHAUL SHOP	Y	PROVIDES SPACE ASSOCIATED WITH PROCESSING JET, TURBOJET, AND RECIPROCATING TYPE AVIATION ENGINES IN TERMS OF OVERHAUL, LOW TIME REPAIR, COMPLETE REPAIR, AND MAJOR INSPECTION. THE WORK FUNCTIONS PERFORMED WITHIN THIS SPACE INCLUDE UNCANNING, DISASSEMBLY, CLEANING, MATERIAL EXAMINATION, PARTS RECONDITIONING, SUBASSEMBLY, FINAL ASSEMBLY AND PRESERVATION.
21121	2112	B	[SF]			ENGINE MAINTENANCE SHOP	Y	PROVIDES SPACE FOR ALL WORK CENTERS WITHIN THE POWER PLANTS DIVISION OF AN INTERMEDIATE LEVEL MAINTENANCE ACTIVITY (IMA).
21122	2116	B	[SF]			ENGINE PREPARATON & STORGE	Y	PROVIDES SPACE USED IN PREPARING ENGINES FOR TEST, STORAGE OR SHIPMENT FOR THE ENGINE PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT).
21123	2116	B	[SF]			ENGINE EXAM & EVALUATON SH	Y	ENGINE EXAMINATION AND EVALUATION SHOP OF THE NAVAL AIR DEPOT OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE: ENGINE NON-DESTRUCTIVE TESTING SHOP; AND ENGINE EXAMINATION AND EVALUATION, PRE-SHOP ANALYSIS, EXAMINATION AND INSPECTION SHOP.
21124	2116	B	[SF]			DED A/C ENG OH	Y	DEDICATED AIRCRAFT ENGINE OVERHAUL & GENERAL PROCESS SHOP TO SUPPORT THE ENGINE PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE: ENGINE DEDICATED CLEANING SHOP; ENGINE DEDICATED PAINT SHOP; ENGINE DEDICATED MACHINE SHOP; ENGINE DEDICATED PLATING SHOP; ENGINE DEDICATED WELDING SHOP; AND ENGINE DEDICATED MODIFICATION AND REPAIR SHOP.
21125	2116	B	[SF]			JET ENGINE OVERHAUL SHOP	Y	JET ENGINE OVERHAUL SHOP SUPPORTS THE ENGINE PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT).

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21126	2116	B	[SF]			RECIPROCAT ENGINE OVERHAUL	Y	RECIPROCATING ENGINE OVERHAUL SHOP SUPPORTS THE ENGINE PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT).	
21127	2116	B	[SF]			TURBINE ENGINE OVERHAUL SH	Y	TURBINE ENGINE OVERHAUL SHOP SUPPORTS THE ENGINE PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT).	
21130	2116	B	[SF]			A/C & ENGINE ACCES OVERHAL	Y	PROVIDES SPACE FOR THE OVERHAUL AND TESTING OF MISCELLANEOUS ACCESSORIES SUCH AS CONTROL ASSEMBLIES, ENGINE FUEL SYSTEM COMPONENTS, AND ACCESSORIES GEAR DRIVE FOR THE ACCESSORIES AND COMPONENTS PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT).	
21131	2116	B	[SF]			DED A/C & ENG AC OH GEN PR	Y	DEDICATED AIRCRAFT AND ENGINE ACCESSORIES OVERHAUL SHOP INCLUDES THE FOLLOWING DEDICATED SHOPS: CLEANING, PAINT, MACHINE, PLATING, WELDING, EXAMINATION AND EVALUATION, PRE-SHOP ANALYSIS, EXAMINATION AND INSPECTION, HAZARDOUS TEST SHOP.	
21132	2116	B	[SF]			METAL COMPONENTS SHOP	Y	ACCESSORIES AND COMPONENTS PRODUCTION SHOP OF THE NAVAIR DEPOT INCLUDES THE FOLLOWING SHOPS: TANK AND RADIATOR REPAIR; SHEET METAL; METAL SURFACE; SEAT REPAIR, METAL BONDING, AND CONTAINER RECLAMATION.	
21133	2116	B	[SF]			NON-METAL COMPONENTS SHOP	Y	NON-METALS COMPONENTS SHOP OF THE NAVAIR DEPOT INCLUDES THE FOLLOWING SHOPS: LIFE RAFT REPAIR; RUBBER REPAIR SHOP; PARACHUTE REPAIR SHOP; FABRIC AND UPHOLSTERY SHOP; TIRE REPAIR SHOP; PLASTIC AND FIBERGLASS SHOP; AND COMPOSITE REWORK SHOP.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21134	2116	B	[SF]			DYNAMIC COMPONENTS SHOP	Y	ACCESSORIES AND COMPONENTS PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NADEP). INCLUDED WITHIN THIS CATEGORY CODE ARE: PROPELLER AND PROPELLER CONTROL OVERHAUL SHOP; ROTOR HEAD OVERHAUL SHOP; ROTOR BLADE OVERHAUL SHOP; TRANSMISSION/GEARBOX OVERHAUL SHOP; AND DYNAMIC DRIVE SYSTEM OVERHAUL SHOP.	
21135	2116	B	[SF]			HYDRAULIC COMPONENTS SHOP	Y	HYDRAULIC COMPONENTS SHOP OF THE NAVAIR DEPOT. INCLUDED WITHIN THIS CATEGORY CODE ARE: HYDRAULIC COMPONENTS OVERHAUL SHOP; BEARINGS SHOP; AND AIRCRAFT LANDING GEAR SHOP.	
21136	2116	B	[SF]			ELECTRICAL COMPONENTS SHOP	Y	ELECTRICAL COMPONENTS SHOP OF THE NAVAIR DEPOT. INCLUDED WITHIN THIS CATEGORY CODE ARE: ALTERNATOR DRIVE OVERHAUL SHOP; ELECTRICAL ACCESSORIES OVERHAUL AND TEST SHOP; BATTERY SHOP; CONSTANT SPEED DRIVE SHOP; AND ELECTRO-MECHANICAL COMPONENTS SHOP.	
21137	2116	B	[SF]			TURBINE ACCESSORIES SHOP	Y	TURBINE ACCESSORIES SHOP OF THE NAVAIR DEPOT. INCLUDED WITHIN THIS CATEGORY CODE ARE: TURBINE ACCESSORIES OVERHAUL SHOP; TURBINE ACCESSORIES TEST SHOP; GENERAL PURPOSE UNITS SHOP; GENERAL PURPOSE UNITS TESTS SHOP; RAM/AIR TURBINE ACCESSORIES OVERHAUL SHOP; AND RAM/AIR TURBINE ACCESSORIES TEST SHOP.	
21138	2116	B	[SF]			PNEUMATIC OXYGEN SHOP	Y	PNEUMATIC OXYGEN SHOP SUPPORTS THE ACCESSORIES AND COMPONENTS PRODUCTION SHOP OF THE NAVAIR DEPOT. INCLUDED WITHIN THIS CATEGORY CODE ARE: PNEUMATIC COMPONENTS OVERHAUL SHOP; CRYOGENICS SHOP; AND OXYGEN EQUIPMENT SHOP.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
21139	2116	B	[SF]			OPTICAL & PHOTOGRAPHIC COM	Y	OPTICAL AND PHOTOGRAPHIC COMPONENTS SHOP SUPPORTS THE ACCESSORIES AND COMPONENTS PRODUCTION SHOP OF THE (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE: PHOTOGRAPHIC EQUIPMENT REPAIR SHOP AND OPTICAL COMPONENT REPAIR SHOP.
21140	2116	B	[SF]			ELECTRON, COMM & ARM SYS SH	Y	A SHOP THAT PROVIDES SPACE ASSOCIATED WITH PROCESSING AIRBORNE COMMUNICATION AND NAVIGATION EQUIPMENT, INSTRUMENTS, AIRBORNE DATA COMPUTERS, FIRE CONTROL AND BOMBING SYSTEM EQUIPMENT, GYROSCOPES, INERTIAL GUIDANCE SYSTEMS, AND OTHER AVIONICS EQUIPMENT.
21141	2116	B	[SF]			DED ELEC, COM & ARM GEN PRO	Y	SPECIALIZED SHOP THAT SUPPORTS THE ELECTRONIC, COMMUNICATION, AND ARMAMENT SYSTEMS PRODUCTION SHOP OF THE NAVAIR DEPOT. INCLUDED WITHIN THIS CATEGORY CODE ARE ELECTRONICS, COMMUNICATION, AND ARMAMENT SYSTEMS DEDICATED: CLEANING SHOP; PAINT SHOP; MACHINE SHOP; WELDING SHOP; PLATING SHOP; BEARINGS SHOP; AND INSTRUMENT OVERHAUL SHOP.
21142	2116	B	[SF]			ELECTRONIC SYS COMPONENTS	Y	SPECIALIZED SHOP THAT SUPPORTS ELECTRONIC, COMMUNICATION, AND ARMAMENT SYSTEMS PRODUCTION SHOP OF THE NAVAIR DEPOT. INCLUDED WITHIN THIS CATEGORY CODE ARE: ARMAMENT AND AVIONICS SHOP; AIRBORNE SYSTEMS SOFTWARE SHOP; NAVIGATIONAL AIDS REPAIR SHOP; AND AVIONICS TESTING SHOP.
21143	2116	B	[SF]			INERTIAL QUAL INSTRU OH SH	Y	INERTIAL QUALITY INSTRUMENT OVERHAUL SHOP OF THE NAVAIR DEPOT. INCLUDED WITHIN THIS CATEGORY CODE ARE: INERTIAL QUALITY GYROSCOPE OVERHAUL SHOP AND INERTIAL GUIDANCE SYSTEM OVERHAUL AND CALIBRATION SHOP.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
21144	2116	B	[SF]			NON-INERTIAL QUAL INSTR OH	Y	SPECIALIZED SHOP THAT SUPPORTS THE ELECTRONIC, COMMUNICATION, AND ARMAMENT SYSTEMS PRODUCTION SHOP OF THE NAVAIR DEPOT. INCLUDED WITHIN THIS CATEGORY CODE ARE: ELECTRONIC INSTRUMENT OVERHAUL SHOP; MECHANICAL INSTRUMENT OVERHAUL SHOP; NON-INERTIAL GYROSCOPE OVERHAUL SHOP; AND MAGNETIC INSTRUMENT OVERHAUL AND TEST SHOP.
21145	2112	B	[SF]			AVIONICS SHOP (NON-DEPOT)	Y	AVIONICS DIVISION INTERMEDIATE MAINTENANCE LEVEL SHOP IS USED FOR THE TESTING, MAINTENANCE AND REPAIR OF AVIONICS SYSTEMS. IT UTILIZES STANDARD SIZE WORK CENTERS, VARIABLE SIZE WORK CENTERS AND SUPPORT SPACES.
21150	2116	B	[SF]			A/C ARMAMENT/MISSILE REWORK	Y	AIRCRAFT ARMAMENT/MISSILE REWORK SHOP IS REQUIRED TO PROVIDE SPACE ASSOCIATED WITH PROCESSING AIRCRAFT WEAPONS INCLUDING GUNS, MISSILES, BOMB RACKS, WEAPON PYLONS, ETC.
21151	2116	B	[SF]			DED A/C ARM/MISSL GEN PURP	Y	A DEDICATED AIRCRAFT ARMAMENT/MISSILE REWORK & GENERAL PURPOSE SHOP SUPPORTS THE ARMAMENT PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE ARMAMENT DEDICATED: CLEANING SHOP; PAINT SHOP; MACHINE SHOP; WELDING SHOP; PLATING SHOP; WEAPON OVERHAUL AND TEST SHOP; ORDNANCE EQUIPMENT SHOP; AND WEAPON ACCESSORIES REPAIR SHOP.
21152	2116	B	[SF]			A/C WEAPON OVERHAUL & TEST	Y	A SHOP IS REQUIRED TO PROVIDE SPACE FOR THE REPAIR OF AIR LAUNCHED MISSILES FOR THE ARMAMENT PRODUCTION SHOP OF THE NAVAIR DEPOT. INCLUDED WITHIN THIS CATEGORY CODE ARE: AIRCRAFT WEAPON OVERHAUL AND TEST SHOP; ORDNANCE EQUIPMENT SHOP; AND WEAPON ACCESSORIES REPAIR SHOP.



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
21153	2116	B	[SF]			AIR LAUNCHED MISSILE REWRK	Y	AIR LAUNCHED MISSILE REWORK SHOP IS REQUIRED TO PROVIDE SPACE FOR THE REPAIR OF AIR LAUNCHED MISSILES FOR THE ARMAMENT PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT).
21154	2112	B	[SF]			AVIATION ARMAMENT SHOP	Y	INTERMEDIATE MAINTENANCE LEVEL SHOP USED TO SUPPORT AIRCRAFT CAPABLE OF BEING ARMED. ALTHOUGH MISSILES AND ROCKETS ARE HANDLED AT THE MISSILE MAINTENANCE SHOP OR ROCKET ASSEMBLY AND LOADING AREAS, MAINTENANCE OF REUSABLE OR NON-EXPENDABLE TYPE ROCKET LAUNCHERS CLASSIFIED AS AMMUNITION ITEMS AND MAINTENANCE AND STORAGE OF MISSILE LAUNCHERS ARE HANDLED IN THE ARMAMENT SHOP.
21155	4412	S	[SF]			AVIATION ARM EQUIP SHED	N	FOR MARINE CORPS ACTIVITIES, AN AVIATION ARMAMENT SUPPORT EQUIPMENT HOLDING SHED IS PLANNED IN CONJUNCTION WITH THE CATEGORY CODE 211 54. THE SHED PROVIDES COVER FOR WEAPONS TRAILERS, BOMB CRADLES, SHORT AIRFIELD AND TACTICAL SUPPORT (SATS) TENTS, AND OTHER ARMAMENT SUPPORT EQUIPMENT AND IS AN INTEGRAL PART OF MARINE CORPS HEADQUARTERS AND MAINTENANCE SQUADRONS; ORDNANCE DIVISIONS
21160	2116	B	[SF]			SUPPORT EQUIP REWORK SHOP	Y	A SUPPORT EQUIPMENT REWORK SHOP IS REQUIRED TO PROVIDE SPACE ASSOCIATED WITH PROCESSING AVIATION GENERAL AND SPECIAL SUPPORT EQUIPMENT AND AEROSPACE GROUND SUPPORT EQUIPMENT.
21161	2116	B	[SF]			DED SUP EQUIP REWRK GEN PR	Y	SPECIALIZED SHOP USED TO SUPPORT THE SUPPORT EQUIPMENT PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE SUPPORT EQUIPMENT DEDICATED: CLEANING SHOP; PAINT SHOP; MACHINE SHOP; PLATING SHOP; AND WELDING SHOP.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21162	2116	B	[SF]			SUPPORT EQUIP CALIBRATION	Y	SPECIALIZED SHOP USED TO SUPPORT THE SUPPORT EQUIPMENT PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE: AERONAUTICAL ELECTRONIC SUPPORT EQUIPMENT SHOP; ELECTRONIC TEST SYSTEMS REPAIR SHOP; AND PRECISION MEASUREMENT EQUIPMENT SHOP .	
21163	2116	B	[SF]			GROUND SUPPORT EQUIP REWK	Y	A GROUND SUPPORT EQUIPMENT REWORK SHOP IS REQUIRED FOR THE SUPPORT EQUIPMENT PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE: GSE MAINTENANCE SHOP, TRAINING DEVICES SHOP, HYDROSTATICS SHOP. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.	
21164	2116	B	[SF]			GROUND SUP EQUIP HOLD SHED	Y	A GROUND SUPPORT EQUIPMENT HOLDING SHED IS REQUIRED FOR THE SUPPORT EQUIPMENT PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.	
21165	2112	B	[SF]			WEAPONS EQUIPMENT SHOP	Y	AN AIRBORNE WEAPONS SUPPORT EQUIPMENT SHOP IS REQUIRED FOR THE SUPPORT EQUIPMENT PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.	
21170	2116	B	[SF]			MANUFACTUING & REPAIR SHOP	Y	A MANUFACTURING AND REPAIR SHOP IS REQUIRED TO PROVIDE SPACE FOR AIRCRAFT REPAIR OPERATIONS BY SUCH WORK FUNCTIONS AS PARTS CLEANING AND PAINTING, PLATING AND METAL PROCESSING SHOP. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
21171	2116	B	[SF]			DED MANUF & REPR GEN PURP	Y	A MANUFACTURING AND REPAIR - GENERAL PURPOSE SHOP IS REQUIRED FOR THE MANUFACTURE AND REPAIR PRODUCTION SHOP (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE: WELDING SHOP, FOUNDRY SHOP, PEENING AND BLASTING SHOP, NON- DESTRUCTIVE INSPECTION & MAGNETIC PARTICLE, DYE PENETRANT, ETC, PARTS CLEANING SHOP, PARTS PAINTING SHOP, THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.
21172	2116	B	[SF]			METAL FABRICATION/MANU FACT	Y	A METAL FABRICATION/MANUFACTURING SHOP IS REQUIRED FOR THE MANUFACTURE AND REPAIR PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE: MACHINE SHOP, GRINDING SHOP, NC MACHINE SHOP, METAL PARTS FABRICATION SHOP. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.
21173	2116	B	[SF]			METAL TREATMENT SHOP	Y	A METAL TREATMENT SHOP IS REQUIRED FOR THE MANUFACTURE AND REPAIR PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE: METAL PROCESSING SHOP, PLATING SHOP, HEAT TREATING SHOP. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.
21174	2116	B	[SF]			NON-METAL FABRICA/MANUF SH	Y	A NON-METAL FABRICATION/MANUFACTURING SHOP IS REQUIRED FOR THE MANUFACTURE AND REPAIR PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE: PLASTIC FABRICATION SHOP, PATTERN SHOP, DECAL (GRAPHIC ARTS) SHOP, WOODWORKING SHOP, RUBBER FABRICATION SHOP. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG IND.	DESCRIPTION
			AREA	OTHER	ALT			
21175	2184	B	[SF]			PARACHUTE & SURVL EQUIPT	Y	AN AVIATION LIFE SUPPORT SYSTEMS SHOP IS REQUIRED AT NAVY AND MARINE CORPS AIR INSTALLATIONS FOR INSPECTING, REPAIRING, AND REPACKING OF PARACHUTES, FLOTATION DEVICES, OXYGEN AND OTHER LIFE SUPPORT EQUIPMENT.
21176	2116	B	[SF]			MISC PARTS/COMPNT REPR	Y	A MISCELLANEOUS PARTS/COMPONENTS REPAIR SHOP IS REQUIRED FOR THE MANUFACTURE AND REPAIR PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). INCLUDED WITHIN THIS CATEGORY CODE ARE: TUBING SHOP, CABLE SHOP, CORDAGE (FLIGHT CONTROLS) SHOP, ELECTRICAL CABLE/HARNESS SHOP. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.
21180	2116	B	[SF]			TEST AND CALIBRATION SHOP	Y	A TEST AND CALIBRATION SHOP IS REQUIRED TO PROVIDE SPACE DEDICATED TO TEST, TRIM, OR CALIBRATE ENGINES, ELECTRONICS, COMMUNICATIONS OR ARMAMENT SYSTEMS. THIS IS THE MAIN CATEGORY CODE USED FOR THE TEST AND CALIBRATION PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NADEP). THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.
21181	2118	S	[SF]	EA		ENGINE TEST CELL	Y	AN ENGINE TEST CELL PROVIDES AN ACOUSTICALLY ATTENUATED AND FULLY INSTRUMENTED ENCLOSURE IN WHICH UNINSTALLED TURBOJET AND TURBOFAN ENGINES ARE TESTED AT INSTALLATIONS WHERE INTERMEDIATE LEVEL MAINTENANCE ENGINE REPAIR WORK IS PERFORMED.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG IND.	DESCRIPTION
			AREA	OTHER	ALT			
21182	2116	B	[SF]			A/C WEAPONS ALIGNMENT SHEL	Y	A MINIMUM OF ONE AIRCRAFT WEAPONS ALIGNMENT SHELTER IS REQUIRED AT NAVY AND MARINE CORPS AIR INSTALLATIONS HAVING FIGHTER OR ATTACK AIRCRAFT WEAPONS SYSTEMS REQUIRING ALIGNMENT, WHICH IS THE PROCESS OF MECHANICALLY AND ELECTRICALLY ALIGNING AIRCRAFT WEAPONS ELECTRONIC SYSTEMS TO A COMMON AIRCRAFT AXIS.
21183	2118	S	[SF]	EA		ENGINE TEST CELL	Y	AN ENGINE TEST CELL IS REQUIRED FOR THE TEST AND CALIBRATION PRODUCTION SHOP OF THE (NAVAIR DEPOT). INCLUDED WITHIN THIS CATCODE ARE: VARIOUS JET ENGINE TEST CELLS, JET ENGINE TEST STAND, VARIOUS RECIPROCATING ENGINE TEST CELLS, RECIPROCATING ENGINE TEST STAND, AND TURBO SHAFT, TURBO FAN AND PNEUMATIC GAS/AIR TURBINE TEST CELLS. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.
21184	2116	B	[SF]			HELICOPTER BLADE TEST FAC	Y	A HELICOPTER BLADE TEST FACILITY IS REQUIRED FOR THE TEST AND CALIBRATION PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.
21185	2116	B	[SF]			RADOME TEST FACILITY	Y	A RADOME TEST FACILITY IS REQUIRED FOR THE TEST AND CALIBRATION PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.
21186	2116	B	[SF]	EA		RADAR/ANTENNA TEST FAC	Y	A RADAR/ANTENNA TEST FACILITY IS REQUIRED FOR THE TEST AND CALIBRATION PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21187	2116	B	[SF]	EA		A/C WEAPON ALIGN/BORESIGHT	Y	AN AIRCRAFT WEAPONS ALIGNMENT/BORESIGHT FACILITY IS REQUIRED FOR THE TEST AND CALIBRATION PRODUCTION SHOP OF THE NAVAL AIR DEPOT (NAVAIR DEPOT). THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.	
21188	2118	S		[EA]		POWER CK PAD W/ SOUND SUPP	Y	POWER CHECK PADS WITH SOUND SUPPRESSION, ARE PROVIDED WITH FIXED OR PORTABLE SOUND SUPPRESSORS, TO MEET DESIRED NOISE CRITERIA.	
21189	2118	S		[EA]		POWER CK PAD W/O SOUND SUP	Y	THE POWER CHECK PAD IS USED TO TEST AND ADJUST ENGINES MOUNTED IN THE AIRCRAFT FOR IN-FRAME TESTING.	
21190	2116	B	[SF]			OTHER SUPPORT FACILITIES	Y	THE OTHER SUPPORT FACILITIES ARE THOSE AREAS USED TO PERFORM PRODUCTIVE NAVAIR DEPOT WORK THAT HAVE NOT BEEN PREVIOUSLY IDENTIFIED. THIS INCLUDES RAMP, APRON, AND AIRCRAFT STORAGE SITES. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.	
21191	2118	S	[SF]		EA	UNCOVERED RAMP	Y	UNCOVERED RAMP IS REQUIRED TO PERFORM NAVAIR DEPOT-SPECIFIC MAINTENANCE AND PRODUCTION FUNCTIONS. INCLUDED WITHIN THIS CATEGORY CODE ARE: AIRCRAFT REWORK APRON, RECLAMATION APRON, ARMAMENT AND DISARMAMENT PAD, PREDOCK/POSTDOCK APRON, AIRCRAFT CORROSION CONTROL FACILITY, GROUND CHECK/FLIGHT TEST SUPPORT. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.	
21192	2116	B	[SF]			COVERED GRND CK/FLIHT TEST	Y	A COVERED GROUND CHECK/FLIGHT TEST FACILITY IS REQUIRED FOR THE NAVAL AIR DEPOT (NAVAIR DEPOT).	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21193	2116	B	[SF]			ENGINEERING LABORATORY	Y	AN ENGINEERING LAB IS REQUIRED TO PROVIDE SPACE TO SUPPORT NAVAIR DEPOT-SPECIFIC MAINTENANCE AND PRODUCTION FUNCTIONS. INCLUDED WITHIN THIS CATEGORY CODE ARE: MATERIAL HANDLERS/PARTS EXPEDITERS, MATERIAL CONTROL LABORATORY, STANDARDS LABORATORY, PROGRAMMER;S ; AUTOMATIC TEST EQUIPMENT AND NUMERICAL CONTROLLED MACHINE. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.	
21194	2118	S	[SF]	EA		AIRCRAFT POWER CHECK FAC	Y	AIRCRAFT POWER CHECK FACILITIES ARE REQUIRED TO PERFORM NAVAIR DEPOT-SPECIFIC MAINTENANCE AND PRODUCTION FUNCTIONS. INCLUDED WITHIN THIS CATEGORY CODE ARE: POWER CHECK PADS WITH AND WITHOUT SUPPRESSION, PROPELLOR AIRCRAFT, HELICOPTER AIRCRAFT AND VSTOL AIRCRAFT POWER CHECK PADS.	
21195	2116	B	[SF]			MATERIAL & EQUIP STAG/STOR	Y	A MATERIAL AND EQUIPMENT STAGING/STORAGE FACILITY FOR NAVAL AIR DEPOT (NAVAIR DEPOT) IS REQUIRED TO PROVIDE SPACE FOR PACKAGING AND PRESERVATION OF MATERIAL. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.	
21196	2116	B	[SF]			MAINT AC SPARE / STOR	Y	AIRCRAFT PARTS/SPARES STORAGE FACILITY.	
21197	2116	B	[SF]			PLANT SERVICES FOR A/C OH	Y	AIRCRAFT OVERHAUL FACILITY IS USED FOR FUNCTIONS SUCH AS MANAGEMENT, SUPERVISION, ENGINEERING, CLERICAL FUNCTIONS, PLANT MAINTENANCE, CENTRAL OR GENERAL STORAGE, QUALITY ASSURANCE, AND MATERIALS TESTING. THIS CATCODE INCLUDES OFFICES, CAFETERIAS, SUPERVISORS; WORK SPACE, SHOP PARTS STORAGE AREAS, DISPATCHING FACILITIES, INSPECTION FACILITIES, STAIRWELLS, AUXILIARY EQUIPMENT ROOMS, WALLS, ETC.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21198	2116	B	[SF]	EA		A/C ACOUSTICAL ENCLOSURE	Y	THE AIRCRAFT ACOUSTICAL ENCLOSURE, SOMETIMES REFERRED TO AS A HUSH HOUSE, IS A TOTAL ENCLOSURE FOR FIXED WING AIRCRAFT DESIGNED TO ABATE NOISE DURING IN-FRAME RUN-UP OF JET ENGINES. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.	
21199	4413	B	[SF]			HAZARDOUS MATERIAL STORE	Y	A HAZARDOUS MATERIAL STOREHOUSE FOR NAVAL AIR DEPOT (NAVAIR DEPOT) IS REQUIRED TO PROVIDE SPACE FOR THE STORAGE OF HAZARDOUS SUBSTANCES AND MATERIALS. THERE ARE NO SPECIFIC CRITERIA DEVELOPED FOR THIS CATEGORY CODE.	
212						MAINT - GUIDED MISSILES			Facilities and shops for maintenance and repair of guided missile systems, ground handling, and launching equipment. Under certain circumstances, the maintenance and storage for these missiles are integrated and the missiles are maintained where they are stored.
21210	2121	B	[SF]			GUIDED MISSILE INTEGRA FAC	Y	THE PURPOSE OF THIS FACILITY IS TO ASSEMBLE NEW-PRODUCTION COMPONENTS OF AIR LAUNCHED GUIDED MISSILES AND PERFORM ANY REQUIRED MAINTENANCE ON FLEET RETURNED ALL- UP-ROUND (AUR) MISSILES OR COMPONENTS.	
21220	2123	B	[SF]			MISSILE EQUIP MAINT SHOP	Y	MISSILE EQUIPMENT MAINTENANCE SHOP.	
21230	2121	B	[SF]			MISSILE ASSBLY & TEST BLDG	Y	THIS FACILITY IS REQUIRED FOR INTERMEDIATE LEVEL MAINTENANCE OF SURFACE LAUNCHED GUIDED MISSILES.	
21240	2124	S		[EA]		MISSILE COMPT SLING TESTER	N	THIS FACILITY IS USED TO TEST THE TENSILE STRENGTH OF ALL FORMS OF WEAPONS HANDLING EQUIPMENT SUCH AS SLINGS, BEAMS, BARS, ETC. IT IS USED IN TESTING DEVELOPMENTAL EQUIPMENT AND THE PERIODIC TESTING OF HANDLING EQUIPMENT.	



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21250	2126	B	[SF]			SUB BAL MISSILE PROCES FAC	Y	THESE FACILITIES ARE REQUIRED TO RECEIVE COMPONENTS; CHECKOUT, ASSEMBLE, REFURBISH, AND REPAIR SUBMARINE LAUNCHED BALLISTIC MISSILES. NO PLANNING FACTORS ARE CURRENTLY AVAILABLE FOR THIS FACILITY.	
21277	2121	B	[SF]			MISSILE/SPARE STRG(MISC)	Y	THESE FACILITIES ARE STORAGE FACILITIES FOR MISCELLANEOUS EQUIPMENT OR GOODS RELATED TO GUIDED MISSILES. THERE ARE NO CRITERIA FOR THIS TYPE OF FACILITY.	
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213						MAINT - SHIPS/SPARES			
<p>Facilities for maintenance of vessels of all types. These facilities include graving dry docks, fixed cranes, marine railways, ship repair shops, and amphibian vehicle maintenance shops. For waterfront operational facilities, see Category Group 150. For administrative facilities, see Facility Class 600.</p>									
21310	2131	S	[SF]	LF	DS	DRYDOCK	Y	A DRY DOCK IS A LONG NARROW BASIN SITED IN THE FORESHORE OF A HARBOR. ITS ENTRANCE IS CLOSED BY A MOVABLE CAISSON OR BY GATES. THE BASIN IS SO CONSTRUCTED THAT A VESSEL MAY BE PLACED IN IT AND THE WATER REMOVED, ALLOWING THE VESSEL TO SETTLE ON SUPPORTS LOCATED ON THE DOCK FLOOR.	
21320	2132	S	[EA]		TN	MARINE RAILWAY	Y	THE FUNCTION OF A MARINE RAILWAY IS TO BRING A VESSEL OUT OF THE WATER FOR THE PURPOSE OF MAKING ALL PARTS AVAILABLE FOR OVERHAUL, AND TO RETURN THE VESSEL TO THE WATER WHEN THE WORK IS FINISHED.	
21330	2133	B	[SF]			SHORE INTERMED MAINT FCTY	Y	THIS FACILITY (SIMA) PROVIDES SPACE FOR THE FLEET INTERMEDIATE LEVEL MAINTENANCE OPERATIONS. A SIMA HAS TWO BASIC COMPONENTS: MAINTENANCE SHOPS AND ADMINISTRATION.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21340	2137	S	[EA]		TN	FIXED CRANE STRUCTURES	Y	THE PRINCIPAL TYPES OF FIXED CRANES ARE PILLAR, PILLAR-JIB, AND JIB. THE HAMMERHEAD AND TOWER CRANES ARE ALSO CLASSED AS STATIONARY WHEN MOUNTED ON FIXED TOWERS.	
21341	2133	B	[SF]			CENTRAL TOOL SHOP	Y	THE CENTRAL TOOL SHOP IS RESPONSIBLE FOR THE DESIGN, DEVELOPMENT, MANUFACTURE AND MAINTENANCE OF PROTOTYPE AND CONVENTIONAL TOOLING SUCH AS CUTTING MACHINES, DIES, MOLDS, CLEANLINESS PLUGS, CUTTERS, JIGS, FIXTURES, AND SPECIAL TOOLS.	
21342	2133	B	[SF]			SHIPFITTING SHOP	Y	THE SHIPFITTING SHOP IS RESPONSIBLE FOR THE BACK-SHOP MODIFICATION, FABRICATION, REPAIR, AND ASSEMBLY OF VARIOUS METAL STRUCTURAL PARTS OF THE SHIP'S HULL, SUPERSTRUCTURE AND INTERIOR SHIP STRUCTURE BY USING SHIPFITTING EQUIPMENT.	
21343	2133	B	[SF]			SHEET METAL SHOP	Y	THE SHEET METAL SHOP IS RESPONSIBLE FOR DEVELOPING, FABRICATING, AND INSTALLING VENTILATION AND AIR CONDITIONING DUCTWORK; WORKSHOP AND STOWAGE FACILITIES, OUTFITTING THE GALLEY, LABEL PLATES, SOME BERTHING, BULKHEAD AND PARTITIONS AND HABITABILITY AND OFFICE SPACE FITTINGS FOR VESSELS.	
21344	2133	B	[SF]			FORGE & HEAT TRT SP	Y	THE FORGE AND HEAT TREATING SHOP IS RESPONSIBLE FOR HOT-FORGING, HEAT TREATING, INSPECTING, CLEANING, AND REPAIRING VARIOUS METAL STRUCTURAL PARTS OF A SHIP'S HULL, SUPERSTRUCTURE, INTERIOR SHIP STRUCTURE, MECHANICAL SYSTEMS, MACHINERY SYSTEMS, ANCHOR CHAIN, AND SHIP'S PROPELLERS	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
21345	2133	B	[SF]			WELDING SHOP	Y	THE WELDING SHOP IS RESPONSIBLE FOR ALL OF THE WELDING, FLAME CUTTING, CARBON ARC GAUGING, AND RELATED PROCESSES REQUIRED BY THE VARIOUS SHOPS OF THE OPERATIONS AND PRODUCTION RESOURCES DEPARTMENTS OF THE SHIPYARD AND THE PUBLIC WORKS CENTER LOCATED AT THE SHIPYARD.
21348	2133	B	[SF]			QUALITY ASSUR OFF	Y	THE QUALITY ASSURANCE OFFICE IS RESPONSIBLE FOR INSPECTION AND TESTS TO DETERMINE COMPLIANCE WITH SPECIFICATIONS, PLANS, ORDERS, DIRECTIVES, AND SOUND SHOP AND MARINE PRACTICES; NON-DESTRUCTIVE TESTING SERVICES; AND TECHNICAL DIRECTION, CONSULTING AND ADVISORY SERVICES ON THOSE PROCESSES, MATERIALS, AND SYSTEMS FOR FABRICATION AND REPAIR TO SHOPS.
21349	2133	B	[SF]			INSIDE MACH SHOP	Y	THE INSIDE MACHINING SHOP IS RESPONSIBLE FOR PERFORMING HORIZONTAL BORING, VERTICAL BORING, PLANING AND HEAVY LATHE WORK IN MANUFACTURING, ALTERING, AND REPAIRING SHIP MACHINERY AND SHIPYARD MANUFACTURED ITEMS.
21350	2133	B	[SF]			OPTICAL SHOP	Y	OPTICAL SHOP.
21351	2133	B	[SF]			WEAPONS SHOP	Y	THE WEAPONS SHOP IS RESPONSIBLE FOR THE REPAIR, OVERHAUL, ALIGNMENT, INSTALLATION, CHECKING OUT, TESTING AND CALIBRATION OF ALL WEAPONS AND INTEGRATED SYSTEMS.
21352	2133	B	[SF]			MARINE MACH SHOP	Y	THE MARINE MACHINING SHOP IS RESPONSIBLE FOR THE INSTALLATION AND TESTING OF ALL MAIN PROPULSION MACHINERY, AUXILIARIES, RUDDERS, SHAFTING, SEA VALVES, DECK MACHINERY, LAUNDRY AND GALLEY EQUIPMENT, ARRESTING GEAR, AND CATAPULTS ON SHIPS UNDERGOING REPAIR AND CONVERSION.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG IND.	DESCRIPTION
			AREA	OTHER	ALT			
21353	2133	B	[SF]			BOILERMAKING SHOP	Y	THE BOILERMAKING SHOP IS RESPONSIBLE FOR THE REPAIR, CONVERSION, AND BUILDING OF STEAM GENERATING EQUIPMENT USED TO FURNISH STEAM TO MAIN AND AUXILIARY MACHINERY.
21354	2133	B	[SF]			ELECTRICAL SHOP	Y	THE ELECTRICAL SHOP IS RESPONSIBLE FOR ACCOMPLISHING THE INSTALLATION, REPAIR, MAINTENANCE, ALTERATION, TROUBLESHOOTING, AND TEST OF ALL POWER, LIGHTING, AND INTERIOR COMMUNICATION SYSTEMS AND EQUIPMENT ABOARD NAVAL SHIPS AND SUBMARINES;
21355	2133	B	[SF]			PIPEFITTING SHOP	Y	THE PIPEFITTING SHOP IS RESPONSIBLE FOR ACCOMPLISHING THE LAYOUT, FABRICATION, INSTALLATION, DISMANTLING, REPAIR, CLEANING, TESTING, AND INSPECTION OF PIPING SYSTEMS AND GASKETS ON BOTH NUCLEAR AND NON-NUCLEAR SYSTEMS IN THE SHOP AS WELL AS ONBOARD SHIPS AND SUBMARINES;
21356	2133	B	[SF]			WOODWORKING SHOP	Y	THE WOODWORKING SHOP IS RESPONSIBLE FOR ACCOMPLISHING OPERATIONS PERFORMED BY BOAT BUILDERS, WOODCRAFTSMEN, AND SHIPWRIGHTS TO CONSTRUCT AND REPAIR WOODEN AND PLASTIC BOATS, WOODEN PORTABLE BUILDINGS AND SHELTERS, HOLLOW BOOMS, WOODEN TANK, PRACTICE TORPEDOES, AND FLIGHT DECK PANELS; AS WELL AS REPAIR AND MAINTENANCE OF ANY WOOD OR WOOD RELATED ITEMS ABOARD SHIP.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG IND.	DESCRIPTION
			AREA	OTHER	ALT			
21357	2133	B	[SF]			ELECTRONICS SHOP	Y	THE ELECTRONICS SHOP IS RESPONSIBLE FOR ACCOMPLISHING INSTALLATION, REPAIR, OVERHAUL, MODIFICATION CHECK-OUT, ADJUSTMENT, TEST, AND CALIBRATION OF RADAR, SONAR, COMMUNICATIONS, CRYPTOGRAPHIC DATA PROCESSING, ANTENNAS, NAVIGATION, AND ELECTRONIC COUNTERMEASURE EQUIPMENT AND SYSTEMS ON AND FOR SURFACE SHIPS, SUBMARINES, AND SHORE STATIONS.
21358	2133	B	[SF]			BOAT SHOP	Y	OPERATIONAL BOAT SHOP.
21359	2133	B	[SF]			ABRASIVE BLAST FACILITY	Y	ABRASIVE BLAST FACILITY.
21360	2133	B	[SF]			PAINT & BLASTNG SHP	Y	THE PAINT AND BLASTING SHOP IS RESPONSIBLE FOR SURFACE PREPARATION, INCLUDING ABRASIVE BLASTING, FOR THE APPLICATION OR INSTALLATION OF PROTECTIVE, DECORATIVE, AND FUNCTIONAL PAINTS, COATINGS, FILMS, AND FOR INSTALLATION OF DECK, FLOOR, AND WALL COVERINGS.
21361	2133	B	[SF]			RIGGING SHOP	Y	THE RIGGING SHOP IS RESPONSIBLE FOR OPERATIONS PERFORMED BY RIGGERS, SAILMAKERS, TANK AND COMPONENT CLEANERS, LABORERS, UPHOLSTERERS, FABRIC WORKERS, AND DIVING OPERATIONS REQUIRED FOR REPAIR, OVERHAUL, CONVERSION, AND CONSTRUCTION OF NAVAL VESSELS AND EQUIPMENT.
21362	2133	B	[SF]			SAIL LOFT	Y	SAIL LOFT.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
21363	2133	B	[SF]			FOUNDRY	Y	THE FOUNDRY IS RESPONSIBLE FOR MANUFACTURING CORES FOR IRON, STEEL, AND NON-FERROUS CASTING IN THE CORE UNIT; PREPARING AND MIXING SAND, PROCESSING AND MAKING MOLDS, STEEL CASTINGS, POURING STEEL FROM FURNACES, MELTING, AND MANUFACTURING STEEL, AND SHAKING OUT STEEL CASTINGS FROM MOLDS AFTER POURING IN THE STEEL FOUNDRY UNIT
21364	2133	B	[SF]			PATTERNMAKING SHOP	Y	THE PATTERNMAKING SHOP IS RESPONSIBLE FOR THE MANUFACTURE, REPAIR, AND ALTERATION OF WOOD PATTERNS REQUIRED TO PRODUCE CASTINGS; MANUFACTURE OF METAL PARTS FOR WOOD AND PLASTIC PATTERNS AND METAL PATTERNS AND MANUFACTURE OF MOCK-UPS FOR PATTERNS.
21365	2136	B	[SF]			NUCLEAR REPAIR SHOP	Y	THE NUCLEAR REPAIR SHOP IS RESPONSIBLE FOR THE REPAIR OF REACTOR PLANT COMPONENTS FOR NUCLEAR SHIPS.
21366	2133	B	[SF]			TEMP SERVICES SHOP	Y	THE TEMPORARY SERVICES SHOP IS RESPONSIBLE FOR ELECTRICAL, PIPING, AND VENTILATION SYSTEMS AS RELATED TO TEMPORARY SERVICES.
21367	2134	B	[SF]			PUMPHOUSE, DRYDOCKS	Y	THE DRY DOCK PUMPHOUSE IS USED TO HOUSE DRY DOCK DEWATERING PUMPS AND ASSOCIATED EQUIPMENT.
21368	2134	B	[SF]			DIVE SHOP	Y	DIVE SHOP
21370	2134	B	[SF]			SHP SVCS SUPT BLDG	Y	A SHIP SERVICES SUPPORT BUILDING IS USED TO PROVIDE OFFICE AND SHOP SPACE IN DIRECT SUPPORT OF MAINTENANCE AND REPAIR WORK FOR SURFACE SHIPS AND SUBMARINES.
21373	2135	S		[EA]		LANDING CRAFT WASH RACK	Y	THE PRIMARY FUNCTION OF THIS FACILITY IS TO WASH DOWN LANDING CRAFT AIR CUSHIONS (LCAC) VEHICLES AFTER EVERY MISSION IN ORDER TO REMOVE SAND AND SALT SPRAY.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21375	2134	B	[SF]			AMPHIB VEHICLE MAINT SHOP	Y	THE AMPHIBIAN VEHICLE MAINTENANCE SHOP PROVIDES SPECIAL WORK AREAS FOR PERFORMING ALL ORGANIZATIONAL MAINTENANCE FUNCTIONS ON THE AMPHIBIAN VEHICLES OF THE MARINE CORPS AMPHIBIOUS TRACTOR BATTALION AND IN THE CASE OF THE NAVY, ALL ORGANIZATIONAL AND INTERMEDIATE LEVEL MAINTENANCE ON LANDING CRAFT AIR CUSHION (LCAC) VEHICLES.	
21377	4421	B	[SF]			MAINT SHPS/SPRS STRG	Y	STORAGE FACILITIES FOR MISCELLANEOUS EQUIPMENT OR GOODS RELATED TO SHIP MAINTENANCE	
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214						MAINT - TANK/AUTOMOTIVE			
Facilities for maintenance and repair of combat and noncombat motorized vehicles. For weapons, see Category Code series 215; for tracked amphibious vehicles see Category Code series 213; for construction equipment see Category Code series 218.									
21410	2141	B	[SF]			COMBAT VEHICLE MAINT SHOP	Y	THIS FACILITY PROVIDES SPECIALIZED WORK AREAS, EQUIPMENT, AND STORAGE FOR OVERHAUL OF COMBAT VEHICLES SUCH AS SELF-PROPELLED GUN CARRIAGES AND TANKS.	
21420	2141	B	[SF]			AUTO VEHICLE MAINT NONCOMB	Y	AUTOMOTIVE VEHICLE MAINTENANCE FACILITIES ARE REQUIRED TO PROVIDE COVERED WORK AREAS FOR INSPECTION, MAINTENANCE, AND REPAIR OF ALL TRANSPORTATION EQUIPMENT ASSIGNED TO AN INSTALLATION, AND AS APPLICABLE, ITS SUPPORTED ACTIVITIES.	
21430	2141	B	[SF]			REFUELING VEHICLE SHOP	Y	AIRCRAFT REFUELER TRUCKS AND OTHER PORTABLE FUEL DISPENSING EQUIPMENT ARE NOT SERVICED OR REPAIRED IN THE AUTOMOTIVE VEHICLE MAINTENANCE SHOP BECAUSE OF THE EXPLOSIVE HAZARD INVOLVED. ACCORDINGLY, A SEPARATE EXPLOSION PROOF AND FIRE-RESISTANT MAINTENANCE/REPAIR FACILITY IS PROVIDED.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21440	1444	B	[SF]			VEHICLE HOLDG SHED	Y	THIS FACILITY IS A PART OF THE AUTOMOTIVE VEHICLE MAINTENANCE SHOP WITH THE MAIN PURPOSE OF PROVIDING A COVERED AREA FOR HOLDING DEADLINED EQUIPMENT AWAITING REPAIRS.	
21451	2141	B	[SF]			AUTO ORGANIZATIONAL SHOP	Y	THIS FACILITY PROVIDES WORK AREAS FOR FLEET MARINE FORCE (FMF) UNITS TO PERFORM MAINTENANCE ON ITEMS OF ORGANIZATIONAL EQUIPMENT.	
21453	2141	B	[SF]			FLD MAINT SHOP	Y	THIS FACILITY PROVIDES SPECIALIZED WORK AREAS FOR PERFORMING 3RD AND 4TH ECHELON MAINTENANCE FUNCTIONS ON ITEMS OF TACTICAL EQUIPMENT INVOLVING PRIMARILY ROLLING STOCK ITEMS OF MOTOR TRANSPORT AND ENGINEER EQUIPMENT.	
21455	2145	S	SF	[EA]		VEHICLE WASH PLATFORM	N	VEHICLE WASH PLATFORMS EQUIPPED WITH HOSE CONNECTIONS SHOULD BE PROVIDED ON THE BASIS OF ONE VEHICLE WASHING SPACE FOR EACH 50 VEHICLES ASSIGNED TO THE MOTOR POOL.	
21456	2145	S	SF	[EA]		GREASE RACK	N	GREASE RACK.	
215						MAINT - WEAPONS, SPARES			
<p>Facilities for maintenance of small arms, automatic weapons, mortars, artillery guns, launchers, flamethrowers, torpedo tubes, harbor protective nets, and non-electronic equipment. See UFC 4-229-01N for design criteria. For missile maintenance facilities, see Category Group 212.</p>									
21510	2152	B	[SF]			SMALL ARMS SHOP	Y	A SMALL ARMS SHOP IS USED TO SUPPORT SMALL ARMS MAINTENANCE AND REPAIR FOR VARIOUS MARINE CORPS ACTIVITIES OR UNITS.	
21520	2152	B	[SF]			LIGHT GUN(20MM/5IN) SHOP	Y	LIGHT GUN (20 MM TO 5 IN) SHOP.	
21530	2152	B	[SF]			HEAVY-GUN (6/16IN) SHOP	Y	HEAVY GUN (6 IN TO 16 IN) SHOP.	
21540	2134	B	[SF]			HARBOR PROTECT NET SHOP	N	HARBOR PROTECTIVE NET SHOP.	



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21550	2152	B	[SF]			LAUNCHR&PROJCTR MAINT SHOP	Y	LAUNCHER AND PROTECTIVE MAINTENANCE SHOP.	
21560	2151	B	[SF]			FLD MAINT SHOP (ORDNANCE)	Y	THIS FIELD MAINTENANCE SHOP PROVIDES SPECIALIZED WORK AREAS FOR PERFORMING 3RD AND 4TH ECHELON MAINTENANCE ON ALL ITEMS OF ORDNANCE EQUIPMENT AUTHORIZED REPAIRED BY THE FORCE SERVICE SUPPORT GROUP (FSSG).	
216						MAINT - AMMO/EXPLSV/TOXI CS			
Facilities for maintenance of ammunition, rockets, bombs, mines, grenades, torpedoes, depth charges, demolition materials, pyrotechnics, missile fuels, and related chemicals.									
21605	2162	B	[SF]		PN	CHANGE / RELIEF HOUSE	N	THIS IS A BUILDING, TYPICALLY ASSOCIATED WITH EXPLOSIVES OPERATING BUILDING(S), CONTAINING FACILITIES FOR EMPLOYEES TO CHANGE TO AND FROM WORK CLOTHES.	
21610	2162	B	[SF]			AMMO REWORK AND O/H SHOP	Y	OVERHAULING AMMUNITION INCLUDES DETERMINING THE SERVICEABILITY OF THE PRIMARY COMPONENTS OF AN ITEM, AND PERFORMING EXTERIOR MAINTENANCE AS REQUIRED TO RENDER THE ITEM FULLY SERVICEABLE.	
21620	2162	B	[SF]			ROCKET REWORK AND O/H SHOP	Y	OVERHAULING ROCKETS INCLUDES DETERMINING THE SERVICEABILITY OF THE PRIMARY COMPONENTS OF AN ITEM, AND PERFORMING EXTERIOR MAINTENANCE AS REQUIRED TO RENDER THE ITEM FULLY SERVICEABLE.	
21630	2162	B	[SF]			MINE&DEPTH CHG REWORK SHOP	Y	OVERHAULING MINES AND DEPTH CHARGES INCLUDES DETERMINING THE SERVICEABILITY OF THE PRIMARY COMPONENTS OF AN ITEM, AND PERFORMING EXTERIOR MAINTENANCE AS REQUIRED TO RENDER THE ITEM FULLY SERVICEABLE.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21640	2162	B	[SF]			TORPEDO SHOP	Y	TORPEDO SHOP FUNCTIONS INCLUDE, BUT ARE NOT LIMITED TO: PREVENTIVE AND CORRECTIVE MAINTENANCE AS WELLS AS HARDWARE AND OPERATIONAL SOFTWARE UPGRADES ON TORPEDO WARSHOT AND EXERCISE CONFIGURATIONS.	
21650	2153	B	[SF]			SPECIAL WEAPONS SHOP	Y	SPECIAL WEAPONS SHOP FUNCTIONS INCLUDE, BUT ARE NOT LIMITED TO, DETERMINING THE SERVICEABILITY OF THE PRIMARY COMPONENTS OF AN ITEM, AND PERFORMING EXTERIOR MAINTENANCE AS REQUIRED TO RENDER THE ITEM FULLY SERVICEABLE.	
21655	2161	B	[SF]			AIR/UNDRWTR WPNS SHOP	Y	THE AUW SHOP CONTAINS SPACE AND EQUIPMENT FOR THE STORAGE, TEST, CHECK, ASSEMBLY, AND LIMITED MAINTENANCE OF AIRBORNE TORPEDOES AND OTHER AIRDROP WEAPONS.	
21660	2162	B	[SF]			QUALITY EVALUATION LAB	Y	A QUALITY EVALUATION LABORATORY (QEL) SUPPORTS THE QE PROGRAM BY PERFORMING ANALYSIS AND TESTS TO DETERMINE AND MAINTAIN QUALITY ASSURANCE OF AMMUNITION, EXPLOSIVES AND TOXINS.	
21677	2162	B	[SF]			AMMO/EXPLSV MAINT STORAGE	Y	STORAGE FACILITIES FOR MISCELLANEOUS EQUIPMENT RELATED TO AMMUNITION/EXPLOSIVES MAINTENANCE FACILITIES	
217						MAINT - ELECNX/COMM EQUIP			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
Facilities and shops for maintenance and repair of radio and radar equipment, antennas, radiation aids, sonar equipment, transmission and reception equipment, and guided bombs.									
21710	2171	B	[SF]			ELECNX/COMMS MAINT SHOP	Y		ELECTRONICS MAINTENANCE SHOPS PROVIDE FACILITIES FOR MAINTENANCE AND REPAIR OF NON-AIRBORNE EQUIPMENT. IT CONTAINS OFFICE AND SUPPORT SPACES FOR THE EQUIPMENT MAINTENANCE OFFICER (EMO) AND THE EMO STAFF, EQUIPMENT MAINTENANCE AND TRAINING AREAS, AND A SMALL STORAGE AREA FOR PARTS AND SUPPLIES DIRECTLY UNDER THE CONTROL OF THE EMO.
21720	2173	S		[EA]		COLLIMATION TOWER	N		COLLIMATION FACILITIES ARE REQUIRED AT SHIPYARDS FOR ELECTRONIC AND OPTICAL ALIGNMENT OF FIRE CONTROL AND RADAR EQUIPMENT ABOARD SHIPS.
21730	2171	B	[SF]			FLD MAINT SHOP(ELEC/COMMS)	Y		THIS FIELD MAINTENANCE SHOP PROVIDES SPECIALIZED WORK AREAS FOR PERFORMING 3RD AND 4TH ECHELON MAINTENANCE ON ALL ITEMS OF COMMUNICATIONS/ELECTRONICS EQUIPMENT AUTHORIZED REPAIRED BY THE SERVICE BATTALION OF THE MARINE DIVISION AND THE FORCE SERVICE REGIMENT. THE SHOP SPACE INCLUDES ADMINISTRATIVE AND TRAINING AREAS AS WELL AS STORAGE SPACE FOR TOOLS, PARTS, AND MAINTENANCE FLOAT EQUIPMENT.
21740	2173	S		[EA]		ANTENNA TEST RANGE	N		THIS FACILITY IS FOR TESTING ELECTRONIC EQUIPMENT AND COMMUNICATION ANTENNAS AFTER COMPLETION OF MAINTENANCE, REPAIR AND OVERHAUL WORK.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21750	2173	S	[EA]			SENSOR ACCURACY CHECK SITE	Y	THE PRIMARY PURPOSE OF THIS FACILITY IS TO MEASURE THE PERFORMANCE OF SHIPBOARD SENSORS IN AN IN-PORT ENVIRONMENT ON COMPLETION OF OVERHAUL OR DURING NORMAL PORT UPKEEP OF NAVY SHIPS. MAJOR COMPONENTS ARE: MOVEABLE AND PILE MOUNTED TRANSDUCERS, MOORING SYSTEM, SLIP SERVICES, ECHO SOUNDER TEST ARRAY AND A AUTOMATIC SHIP'S HEAD MEASURING SYSTEM	
21777	2171	B	[SF]			ELECTRNCS SPRES/MISC STRG	Y	ELECTRONICS PARTS STORAGE FACILITY.	
218						MAINT - MISC MATL & EQUIPT			
Facilities for maintaining/repairing equipments/material not coded in the 211 through 217 and the 219 series.									
21810	2182	B	[SF]			CONTAINER REPAIR/TEST BLDG	Y	A CONTAINER REPAIR AND TEST FACILITY SERVICES ONLY EMPTY CONTAINERS.	
21820	2182	B	[SF]			CONSTR/WT HNDLG EQUIP SHOP	Y	SEPARATE FACILITY FOR THE MAINTENANCE AND REPAIR OF CONSTRUCTION/WEIGHT-HANDLING EQUIPMENT FOR AREAS WHERE COMBINED AUTOMOTIVE, WEIGHT-HANDLING, RAILROAD AND/OR CONSTRUCTION EQUIPMENT MAINTENANCE FACILITIES ARE NOT A PART OF CATEGORY CODE 214 20, AUTOMOTIVE VEHICLE MAINTENANCE SHOP.	
21825	2181	B	[SF]			MAR AIR BASE SQDN FAC	Y	MARINE AIR BASE SQUADRON (MABS) FACILITY.	
21830	2182	B	[SF]			DRUM RECONDITIONING PLANT	Y	THE DRUM RECONDITIONING PLANT IS USED TYPICALLY FOR THE RECONDITIONING OF 55 GAL DRUMS. PROCESSES INCLUDE: WASHING, DE-DENTING, INTERNAL CHAINING, EXTERNAL WIRE BRUSHING, CHIME ROLLING, TESTING, WELDING, INTERNAL PRESERVATION AND PAINTING.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21835	2182	B	[SF]			CABLE REPAIR HOUSE	Y	CABLE REPAIR FACILITY.	
21840	2183	B	[SF]			RAILROAD EQUIPMENT SHOP	Y	THE RAILROAD EQUIPMENT MAINTENANCE FACILITY IS A SPECIAL SHOP TO HOUSE MATERIAL AND EQUIPMENT FOR THE SERVICE AND MAINTENANCE OF RAILROAD LOCOMOTIVES AND LOCOMOTIVE CRANES.	
21845	2182	B	[SF]			INSTRUMNT CALIBRATION SHOP	Y	THIS SHOP PERFORMS CALIBRATION, REPAIR, AND CERTIFICATION OF ALL MEASUREMENT INSTRUMENTS ASSIGNED TO AN ACTIVITY. SPACES WITHIN INCLUDE: CALIBRATION LAB, CLEANING ROOM, UTILITIES ROOM, STORAGE AREA, ADMINISTRATION AREA.	
21850	2181	B	[SF]			BATTERY SHOP	Y	A BATTERY SHOP IS REQUIRED TO SERVICE AND CHARGE BATTERIES.	
21851	2181	B	[SF]			BATTERY RECHARGING SHOP	Y	THIS CATEGORY CODE IS FOR USE AT ACTIVITIES WHICH HAVE A REQUIREMENT TO RECHARGE BATTERY POWERED EQUIPMENT SUCH AS FORKLIFT TRUCKS USED AT SUPPLY CENTERS.	
21860	2181	B	[SF]			GRND SUPPRT EQUIP SHP	Y	THE INTERMEDIATE LEVEL MAINTENANCE OF AIRCRAFT GROUND SUPPORT EQUIPMENT (GSE) IS PERFORMED IN THIS SHOP. GROUND SUPPORT EQUIPMENT, OFTEN REFERRED TO AS YELLOW GEAR, INCLUDES SUCH ITEMS AS TOW TRACTORS, TRUCKS, FORK LIFTS, TRAILERS, COMPRESSORS, POWER GENERATORS, MAINTENANCE STANDS, JACKS AND OTHER GROUND EQUIPMENT WHICH SUPPORT AIRCRAFT OPERATIONS.	
21861	2181	B	[SF]			GRND SUPPRT EQUIP HOLDING	Y	THE GROUND SUPPORT EQUIPMENT (GSE) HOLDING SHED PROVIDES PROTECTIVE COVER FOR GSE GEAR AWAITING AND UNDERGOING INTERMEDIATE LEVEL MAINTENANCE AND IS AN INTEGRAL PART OF THE GSE SHOP COMPOUND.	
21862	2182	B	[SF]			SHIPBD ACFT SUPP EQUIP FAC	Y	SHIPBOARD AIRCRAFT SUPPORT EQUIPMENT FACILITY.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21865	2182	B	[SF]			EQUIP HOLD SHED FOR 218-20	Y	THIS FACILITY IS REQUIRED IN CONJUNCTION WITH CONSTRUCTION/WEIGHT-HANDLING EQUIPMENT SHOP, CATEGORY CODE 218 20 FOR THE PURPOSE OF PROTECTION OF EQUIPMENT AWAITING REPAIRS.	
21868	2182	B	[SF]			PROD EQUIP MAINT SHOP	Y	PRODUCTION EQUIPMENT MAINTENANCE SHOP.	
21870	2182	B	[SF]			OFFICE EQUIP/APPL REPAIR	Y	APPROPRIATE FACILITIES MAY BE PROVIDED TO PERFORM MAINTENANCE AND REPAIR OF OFFICE EQUIPMENT AND SMALL APPLIANCES.	
21871	2182	B	[SF]			DENTAL EQUIP MAINT BLDG	Y	DENTAL EQUIPMENT MAINTENANCE BUILDING.	
21877	2182	B	[SF]			REPAIR SHOP STORAGE	Y	REPAIR SHOP STORAGE FACILITY.	
21880	2182	B	[SF]			FLD MAINT SHOP(GENL SUPPL)	Y	THIS FIELD MAINTENANCE SHOP PROVIDES SPECIALIZED WORK AREAS FOR FLEET MARINE FORCE (FMF) UNITS PERFORMING 3RD AND 4TH ECHELON MAINTENANCE ON ALL ITEMS OF GENERAL SUPPLY EQUIPMENT.	
21890	2182	B	[SF]			AVIA SUP EQUIP SHOP (NALC)	Y	AVIATION SUPPORT EQUIPMENT SHOP.	
21891	2181	B	[SF]			MOBILE VAN SHOP (NALC)	Y	MOBILE VAN SHOP (NALC).	
21892	2182	B	[SF]			AVIA SUPT/FEED SHOP (NALC)	Y	AVIATION SUPPORT/FEEDER SHOP (NALC).	
219						MAINT-INSTAL REPAIR & OPER			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
<p>This basic category includes maintenance shops for repair and overhaul of installation facilities (public works and public utilities), including installed shop and other and other equipment, and utility distribution systems, used in support of maintenance operations at military and/or industrial installations. The maintenance and repair of vehicles and weight-handling and construction equipment, utility plant, and maintenance shops are not included in this category. For the former, see Category Code series 214 and 218, and the latter, see Category Code series 811.</p>								
21910	2191	B	[SF]			PUBLIC WORKS SHOP	Y	THIS FACILITY SUPPORTS THE MAINTENANCE DIVISION OF THE PUBLIC WORKS DEPARTMENT. THIS DIVISION IS RESPONSIBLE FOR MANAGEMENT OF THE PREVENTIVE, MAINTENANCE INSPECTION (PMI) PROGRAM AND IS TASKED TO PERFORM MAINTENANCE ON ALL BUILDINGS, UTILITIES PLANTS AND DISTRIBUTION SYSTEMS, HEATING, AIR-CONDITIONING AND REFRIGERATION SYSTEMS, INTERNAL COMMUNICATIONS AND ALARM SYSTEMS AND ROADS AND TRACKAGE.
21920	4422	S	[SF]			PAVMT/GRNDS EQUIP SHED	Y	THE PAVEMENT AND GROUNDS EQUIPMENT SHOP WILL PROVIDE HOLDING SPACE AND MINOR MAINTENANCE SPACE FOR TRACTORS, LAWNMOWERS, SNOWPLOWS, AND OTHER MISCELLANEOUS EQUIPMENT USED FOR ROADS AND GROUND MAINTENANCE.
21925	2191	B	[SF]			PW EXPENDBL/WORK IN PROCES	Y	THE PUBLIC WORKS SHOPS EXPENDABLE/WORK-IN-PROCESS STORE HOLDS THE READY-ISSUE ITEMS FOR PUBLIC WORKS DAILY MAINTENANCE, JOB ORDER MATERIALS FOR THE MAINTENANCE OF STATION FACILITIES AND MATERIALS THAT ARE CONSIDERED CRITICAL ITEMS FOR EMERGENCIES/SERVICE.
21930	2191	B	[SF]			PAINTG & RELTD OPNS BLDG	Y	THE FUNCTION OF THE PAINTING AND RELATED OPERATIONS BUILDING IS TO PROVIDE SPACE FOR PAINTING AND OTHER OPERATIONS WHICH MAY NOT BE FUNCTIONALLY COMPATIBLE OR HAZARDOUS TO THE BUILDING OR TYPES OF OPERATION CONDUCTED IN THE PUBLIC WORKS SHOP, CATEGORY CODE 219 10.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
21931	2192	S	[EA]			PAINTG & RELTD OPNS STRC	N	THE PAINTING AND RELATED OPERATIONS STRUCTURE IS A FACILITY USED FOR PAINTING AND THOSE OPERATIONS WHICH ARE NOT SUITABLE TO BE CARRIED ON IN CATEGORY CODE 219 30, PAINTING AND RELATED OPERATIONS BUILDING. THIS CODE MAY INCLUDE STRUCTURES LIKE A SANDBLAST SCAFFOLD, PAINT SPRAY BOOTH, PRESERVATION DIP TANK, PICKLING TANK, SANDHOPPER, SANDBLASTING FACILITIES, OPEN PAINT CANOPY, SAND HANDLING BIN.	
21940	2192	S	[EA]			SEWAGE HOSE STORAGE FAC	Y	SEWAGE HOSE STORAGE FACILITY. FOR INVENTORY PURPOSES ONLY.	
21977	2191	B	[SF]			PW MAINTENANCE STORAGE	Y	THIS FACILITY IS A GENERAL WAREHOUSE FOR THE STORAGE OF ITEMS AND MATERIALS REQUIRED FOR THE MAINTENANCE OF STATION BUILDINGS AND GROUNDS.	

220 PRODUCTION

The production facility is part of the production system that processes raw materials, components and labor into finished goods.1 Production facilities are typically one-of-a-kind; therefore space requirements should be developed from the ground up; first for the individual workstations; then departmental requirements by summing the workstations within the department. Applying industrial engineering practices and methods would provide sufficient and accurate space requirements. Accurate future product demand forecasts are necessary so the facility can be sized for future growth. The facility should be sized for forecasted production growth 5 to 10 years beyond initial operating capability.

221 PRODUCTION -  
AIRCRAFT

Facilities for constructing and assembling new components, air frames and related assemblies and spares, aircraft engines and related spares, and aircraft equipment and spares.

22110	2211	B	[SF]			ACFT ENGINE ASSEMBLY PLANT	Y	AIRCRAFT ENGINE ASSEMBLY PLANT.
22120	2211	B	[SF]			AIRFRAME ASSEMBLY PLANT	Y	AIRFRAME ASSEMBLY PLANT.
22130	2211	B	[SF]			ACFT ACCESSORY ASSEMBLY	Y	AIRCRAFT ACCESSORIES ASSEMBLY PLANT.

222 PROD - GUIDED  
MISSILES



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
Facilities for constructing and assembling new components, guided missile systems and parts, ground handling and launching equipment.									
22210	2221	B	[SF]			MISSILE ASSEMBLY PLANT	Y		MISSILE ASSEMBLY PLANT THAT ACCOMODATES MOTOR FINISHING, PARTS STORAGE, ADMIN, CONTROL HOUSE, SHIPPING, INGREDIENT SCREENING, PROPELLANT STORAGE, TOOL STORAGE, BURNING CAGE, BLENDING, GRINDING, DARKROOM, UTILITY STORAGE ETC.
22220	2221	B	[SF]			MISSILE HANDL LAUNCH EQUIP	Y		MISSILE HANDLING LAUNCH EQUIPMENT PLANT.
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223						PRODUCTION - SHIPS, SPARES			
Ship-ways, ground ways, graving docks, marine railways, appurtenant shipyard facilities for the construction of vessels of all types, of floating cranes and dry docks, and of tracked amphibious vehicles. Does not include facilities principally for use in ship maintenance and repair which fall in other categories.									
22310	2231	B	[SF]			FABRICATION/ASSEMBLY BLDG	Y		FABRICATION AND ASSEMBLY BUILDING THAT ACCOMODATES FABRICATION, PROTOTYPE ASSEMBLY, TECH LAB STORAGE, CONSTRUCTION WOOD SHOP, SAND BLAST FACILITY, TECHNICAL SERVICES, AND PROTOTYPE FABRICATION.
22330	2233	S	SF	[EA]	LF	SHIP BUILDING DRYDOCKS	Y		SHIP-BUILDING DRYDOCKS.
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224						PROD - TANK-AUTOMOTIVE			
Facilities for constructing and assembling new components, combat vehicles, non-combat vehicles and related components, self-propelled gun carriages, ambulances, and other motorized vehicles. Excludes production facilities for weapons (225 series), tracked amphibious vehicles (223 series), and construction equipment (228 series.)									
22410	2241	B	[SF]			COMBAT VEHICL ASSEMBL PLT	Y		COMBAT VEHICLE ASSEMBLY PLANT
22420	2241	B	[SF]			AUTO VEHICL ASSEMBL PLT	Y		AUTOMOTIVE VEHICLE ASSEMBLY PLANT.
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225						PROD - WEAPONS/SPARES			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
Facilities for constructing and assembling new components, small arms, automatic weapons, mortars, artillery, guns, launchers, projectors (for arming ships, vehicles, and aircraft,) flame throwers, torpedo tubes, harbor protective nets, non-eletronic equipment and related components, Use Basic Category 222 for facilities for producing guided missile equipment.									
22510	2251	B	[SF]			SMALL ARMS PLANT	Y	SMALL ARMS PLANT.	
22520	2251	B	[SF]			LIGHT GUN (20MM/5IN) PLANT	Y	LIGHT GUN PLANT.	
22530	2251	B	[SF]			HEAVY GUN(6/16IN) PLANT	Y	HEAVY GUN PLANT.	
22540	2251	B	[SF]			HARBOR PROTECT NET PLANT	Y	HARBOR PROTECTIVE NET PLANT.	
22550	2251	B	[SF]			LAUNCHER/PROJECT OR PLANT	Y	LAUNCHER AND PROJECTOR PLANT.	
22560	2251	B	[SF]			ARMOR PLATE PLANT	Y	ARMOR PLATE PLANT.	
226						PROD - AMMO/EXPLSV/TOXI CS			
Facilities for constructing and assembling new components, ammunition, rockets, bombs, mines, grenades, torpedoes, depth charges, demolition materials, pyrotechnics, ATO units, guided missile fuels, ammunition parts and related components and chemicals. For facilities for producing guided bombs use Basic category 227; for commercial-type petroleum products use basic category 228.									
22610	2261	B	[SF]			BAG CHARGE FILLING PLANT	Y	BAG CHARGE FILLING PLANT.	
22615	2261	B	[SF]			CASE FILLING PLANT	Y	CASE FILLING PLANT.	
22620	2261	B	[SF]			CASE O/H TANK REPAIR FAC	Y	CASE OVERHAUL TANK REPAIR FACILITY.	
22625	2261	B	[SF]			40MM LOADING PLANT	Y	40MM-LOADING PLANT.	
22630	2261	B	[SF]			20MM LOADING PLANT	Y	20MM-LOADING PLANT.	
22635	2261	B	[SF]			MAJ-CAL PROJECTL LOAD PLT	Y	LARGE CALIBER PROJECTILES LOADING FACILITY.	
22640	2261	B	[SF]			MED-CAL PROJECTL LOAD PLT	Y	MEDIUM CALIBER PROJECTILE LOADING FACILITY.	
22645	2261	B	[SF]			LARGE CAL ROCKET LOAD PLT	Y	LARGE CALIBER ROCKET MOTOR LOADING PLANT.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
22650	2261	B	[SF]			MED CAL ROCKET LOAD PLT	Y	MEDIUM CALIBER ROCKET LOADING PLANT.	
22655	2261	B	[SF]			CAST HI EXPLOS FILL PLT	Y	CAST HIGH EXPLOSIVES FILLING PLANT.	
22656	2262	S	SF	[EA]		CAST HI EXPLOS FILL FAC	N	CAST HIGH EXPLOSIVES FILLING FACILITY.	
22660	2261	B	[SF]			SPECIAL WEAPONS PLANT	Y	SPECIAL WEAPONS PLANT.	
22665	2261	B	[SF]			PROPELLANT CHEMICAL PLT	Y	PROPELLANT AND RELATED CHEMICAL PLANT.	
22666	2262	S	SF	[EA]		PROPELLANT CHEMICAL FAC	N	PROPELLANT AND RELATED CHEMICAL FACILITY.	
22670	2261	B	[SF]			READY AMMO BELTING PLT	Y	READY AMMUNITION BELTING PLANT.	
22675	2261	B	[SF]			UNDRWTR DEMO EQUIP PLT	Y	UNDERWATER DEMOLITION EQUIPMENT PLANT.	
22680	2261	B	[SF]			AMMUNITION LOADING PLANT	Y	AMMUNITION LOADING PLANT.	
22681	2264	B	[SF]			DEMILITARIZATION BUILDING	Y	DEMILITARIZATION BUILDING.	
22682	2265	S		[EA]		DEMILITARIZATION FACILITY	N	DEMILITARIZATION FACILITY.	
22685	2261	B	[SF]			FUZE ASSEMBLY PLANT	Y	FUZE ASSEMBLY PLANT.	
22686	2261	B	[SF]			MINE ASSEMBLY PLANT	Y	MINE ASSEMBLY PLANT.	
22688	2261	B	[SF]			PYROTECHNIC PRODUCTION FAC	Y	PYROTECHNIC PRODUCTION FACILITY.	

227

PROD -  
ELEC/NX/COMM  
EQUIPT

Facilities for constructing and assembling new components radio and sonar equipment, radiation aids, sonar equipment, transmission and reception equipment, guided bombs and related components.

22710	2271	B	[SF]			RADIO/RADAR EQUIP PLT	Y	RADIO AND RADAR EQUIPMENT PLANT.
22720	2271	B	[SF]			SONAR EQUIPMENT PLANT	Y	SONAR EQUIPMENT PLANT.
22730	2271	B	[SF]			GUIDANCE EQUIPMENT PLANT	Y	GUIDANCE EQUIPMENT PLANT.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
22735	2271	B	[SF]			PRINTED CIRCUIT SHOP	Y	PRINTED CIRCUIT SHOP.	
228						PROD - MISC MATL & EQUIPT			
22810	2281	B	[SF]			PARACHUTE/SURVVL EQUIP PLT	Y	PARACHUTE AND SURVIVAL EQUIPMENT SHOP.	
22820	2281	B	[SF]			CONSTRUCTION EQUIP PLT	Y	CONSTRUCTION EQUIPMENT PLANT.	
22830	2281	B	[SF]			RAILROAD EQUIPMENT PLANT	Y	RAILROAD EQUIPMENT PLANT.	
22835	5302	B	[SF]			OPHTHALMIC SUPPORT BUILDIN	Y	OPHTHALMIC SUPPORT BUILDING.	
229						PROD - DOD MNT,REP & OP			
Plants and facilities for production and processing in support of the maintenance, repair, and operation function at military or industrial installations.									
22910	2291	S	[EA]	TH		ASPHALT PLANT	Y	ASPHALT BATCH PLANT.	
22920	2291	S	[EA]	TH		CONCRETE BATCHING PLANT	Y	CONCRETE BATCH PLANT.	
22930	2291	S	[EA]	TH		ROCK CRUSHER PLANT	Y	ROCK CRUSHER PLANT.	
22950	6103	B	[SF]	EA		PRINTING PLANT	Y	PRINTING PLANT.	
22977	2281	B	[SF]			MAINT/PROD STRG (MISC)	Y	MAINTENANCE PRODUCTION STORAGE- READY ISSUE FACILITY.	
22980	2281	B	[SF]			CONTAINER ASSEMBLY BLDG	Y	CONTAINER (CONEX) ASSEMBLY BUILDING.	
300						RDT&E - FACILITIES			
Research, development, acquisition, test and evaluation facilities include the buildings and other scientific structures and facilities used directly in theoretical and/or applied research, development, acquisition, test and evaluation operations.									
310						SCIENCE LABORATORIES			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
Buildings used directly in theoretical or applied research, development and testing operations related to basic research such as chemistry, materials, medical, biological, sonic, physics, geophysics, etc.								
31010	6100	B	[SF]			RDAT&E ADMINISTRATIVE OFC	Y	BUILDINGS USED DIRECTLY IN THEORETICAL OR APPLIED RESEARCH, DEVELOPMENT AND TESTING OPERATIONS RELATED TO BASIC RESEARCH SUCH AS CHEMISTRY, MATERIALS, MEDICAL, BIOLOGICAL, SONIC, PHYSICS, GEOPHYSICS, ETC.
31011	3101	B	[SF]			ASTRONOMY/ASTROP HYSICS LAB	Y	A FACILITY REQUIRED TO SUPPORT THE INVESTIGATION OF RADIO ASTRONOMY EQUIPMENT, SATELLITE RESEARCH, AND DEVELOPMENT FOR NAVIGATIONAL AND COMMUNICATION PROGRAMS.
31013	3101	B	[SF]			CHEMISTRY/TOXICO LOGY LAB	Y	THE FACILITY REQUIRED TO SUPPORT THE CONDUCTING OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION IN THE AREAS OF PHYSICAL, ORGANIC, INORGANIC, NUCLEAR, AND BIOLOGICAL CHEMISTRY, DIRECTED TOWARDS PROBLEMS OF FUELS, LUBRICANTS, CORROSION, PROTECTIVE COATINGS, ELECTROCHEMISTRY, SUBMARINE ATMOSPHERE PURIFICATION, PROTECTION AGAINST BIOLOGICAL AND CHEMICAL WARFARE AGENTS, AND RELATED PROGRAMS.
31015	3101	B	[SF]			MATERIALS LABORATORY	Y	THIS FACILITY IS USED FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF STATIC, PNEUMATIC NON-DESTRUCTIVE AS WELL AS DESTRUCTIVE TESTING OF COMPONENTS AND ASSEMBLIES FOR NAVY WEAPONS, VEHICLES, ENGINES, SHIPS AND AIRCRAFT.
31017	3101	B	[SF]			OPTICS LABORATORY	Y	THIS FACILITY IS USED IN CONDUCTING RESEARCH, DEVELOPMENT, TEST AND EVALUATION PROGRAMS IN QUANTUM OPTICS, OPTICAL PROPAGATION, LASER PHYSICS, OPTICAL MATERIALS AND OPTICAL WARFARE.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
31019	3101	B	[SF]			PHYSICS LABORATORY	Y	THIS FACILITY IS USED IN RESEARCH, DEVELOPMENT, TEST AND EVALUATION STUDIES IN THE APPLIED SCIENCE OF MATTER AND ENERGY. IT INCLUDES RESEARCH IN SUCH AREAS AS ACOUSTICS, MECHANICS, LIGHT, THERMODYNAMICS, ELECTROMAGNETISM, ATOMIC AND NUCLEAR PHYSICS, CRYOGENICS, SOLID STATE PHYSICS, PARTICLE PHYSICS AND PLASMA PHYSICS, ETC.
31021	3101	B	[SF]			RADIATION EFFECTS LAB	Y	THIS FACILITY IS USED IN CONDUCTING RESEARCH, DEVELOPMENT, TEST AND EVALUATION ON RADIATION CHARACTERISTICS OF VARIOUS DEVICES AND THEIR EFFECT ON PERFORMANCE OF VARIOUS SYSTEMS IN THE AIR AND IN THE OCEAN ENVIRONMENT. IT IS ALSO USED IN THE STUDY OF EFFECTS OF RADIATION ON PEOPLE AND MARINE LIFE AND THE ACCOMPLISHMENT OF STUDIES TO DETERMINE RELIABLE METHODS FOR DETECTING RADIATION SOURCES.
31023	3101	B	[SF]			COMBINED RESEARCH LAB	Y	THIS FACILITY IS USED FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF NAVAL SYSTEMS WHICH UTILIZED SEVERAL OF THE SCIENCES IN A COMBINED SYSTEM APPLIED DIRECTLY TO A FLEET PROBLEM OR AREA OF RDAT&E. IT IS ALSO USED TO SUPPORT RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF NAVAL SYSTEMS WHICH DO NOT LOGICALLY FIT THE OTHER CATEGORIES OF RDAT&E.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
31025	3101	B	[SF]			BIOLOGICAL LABORATORY	Y	THIS FACILITY IS USED IN RESEARCH, DEVELOPMENT, TEST AND EVALUATION IN TERRESTRIAL AND MARINE BIOLOGY AS RELATED TO STRUCTURE CAPABILITIES, FUNCTIONING HABITAT, HEALTH, GROWTH ENVIRONMENTAL INDICATORS, ECOLOGICAL RELATIONSHIPS OF LIVING ORGANISMS AND ASSOCIATION OF BIOLOGICAL PHENOMENON TO MAN'S EXISTENCE AND OPERATIONS IN THE LAND, OCEAN AND SPACE ENVIRONMENT.
31027	3101	B	[SF]			ENVIRONMENTAL LABORATORY	Y	THIS FACILITY IS USED TO SUPPORT THE RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF INSTRUMENTATION AND COMPUTER SYSTEMS FOR MEASUREMENT AND ANALYSIS OF THE EVALUATION OF ENVIRONMENTAL EFFECTS ON VARIOUS EQUIPMENT, WEAPONS SYSTEMS, FACILITIES, ETC.
31029	3101	B	[SF]			ANIMAL APPLICATIONS LAB	Y	THIS FACILITY IS USED TO SUPPORT THE RDT+E ON NON-HUMAN ANIMALS IN PURE RESEARCH AND OCEAN SUPPORT APPLICATIONS. INCLUDING THE USE OF WHALES AND DOLPHINS AS TRAINED DEEP SEA DIVERS, SEALS FOR TOOL RECOVERY AND DOGS AS SENTRIES. IT ALSO INCLUDES R+D IN APPLICATION AND KNOWLEDGE OF ANIMAL CAPABILITIES IN SENSING, HOMING AND IDENTIFICATION TO IMPROVE THE OPERATION OF MAN-MADE OCEAN DEVICES.
31031	3102	B	[SF]			MEDICAL LABORATORY	Y	THIS FACILITY IS USED IN CONDUCTING RESEARCH TOWARD METHODOLOGY FOR DIAGNOSIS, TREATMENT, OR PREVENTION OF DISEASE OR DAMAGE TO THE BODY OR MIND.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG	IND.	
31033	3101	B	[SF]			COMPUTATION/ANALYSIS LAB	Y	THIS FACILITY SUPPORTS RESEARCH, DEVELOPMENT, TEST AND EVALUATION IN THE AREAS OF INFORMATION PROCESSING AND DATA HANDLING, ESPECIALLY WHEN CONCERNED WITH IDENTIFICATION OF CONDITIONS RESPONSIBLE FOR GIVEN DATA CONFIGURATIONS. MATHEMATICAL DATA ANALYSIS UTILIZING BOTH DIGITAL AND ANALOG COMPUTERS TO RESEARCH, DEVELOP, TEST AND EVALUATE NEW NAVAL SYSTEMS	
31037	3101	B	[SF]			OCEAN SCIENCES LABORATORY	Y	THIS FACILITY IS USED TO ACCOMPLISH RDT+E IN MARINE BIOSYSTEMS, ENVIRONMENTAL PROTECTION AND MANAGEMENT, DEVELOPMENT OF ANALYTICAL SYSTEMS FOR EVALUATION OF THE OCEAN ENVIRONMENT, STUDIES OF WAVE DYNAMICS, CURRENT FLOW, THERMOCLINES, CHEMICAL VARIANCES, AS WELL AS DEVELOPMENT OF NEW TECHNIQUES AND EQUIPMENT TO INCREASE MAN'S KNOWLEDGE AND UTILIZATION OF THE TOTAL OCEAN ENVIRONMENT.	
31039	3103	B	[SF]			LEVEL III BIOSAFETY LAB	Y	THIS TYPE OF LABORATORY APPLIES TO CLINICAL, DIAGNOSTIC, AND TEACHING, RESEARCH, OR PRODUCTION FACILITIES FOR WORK INVOLVING INDIGENOUS OR EXOTIC AGENTS THAT HAVE THE POTENTIAL TO TRANSMIT INFECTION THROUGH THE RESPIRATORY SYSTEM, WHICH MAY CAUSE SERIOUS AND POTENTIALLY LETHAL INFECTION.	
31040	3104	B	[SF]			LEVEL IV BIOSAFETY LAB	Y	THIS TYPE OF LABORATORY IS ASSOCIATED WITH WORK ON DANGEROUS AND EXOTIC AGENTS THAT POSE A HIGH INDIVIDUAL RISK OF LIFE-THREATENING DISEASE, AEROSOL TRANSMISSION, OR RELATED AGENT WITH UNKNOWN RISK OF TRANSMISSION.	



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
Buildings used directly in the research, development and testing of air frames and related assemblies and spares, and other aircraft equipment.									
31105	3111	B	[SF]			RDAT&E MAINT HGR	Y	A BUILDING USED FOR THE RESEARCH, DEVELOPMENT, AND TESTING OF AIR FRAMES, RELATED ASSEMBLIES, AND OTHER AIRCRAFT EQUIPMENT. THE FACILITY INCLUDES HIGH BAY/HANGER SPACES, CREW AND EQUIPMENT SPACES, AND ADMIN SUPPORT SPACES.	
31106	2112	B	[SF]			RDAT&E MAINT HGR-01 SPC	Y	RDAT&E MAINTENANCE HANGAR CREW AND EQUIPMENT AREA.	
31107	2112	B	[SF]			RDAT&E MAINT HGR-02 SPC	Y	RDAT&E MAINTENANCE HANGAR ADMINISTRATIVE AREA.	
31110	3111	B	[SF]			AIRCRAFT/FLIGHT EQUIP LAB	Y	THIS FACILITY IS UTILIZED IN CONDUCTING RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF AERODYNAMIC DESIGN OF AIRCRAFT AND WEAPONS SYSTEMS AND NAVIGATIONAL SYSTEMS.	
31120	3111	B	[SF]			AIRCRAFT GRD SUP EQUIP LAB	Y	THIS FACILITY IS USED TO RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF AIRCRAFT GROUND SUPPORT EQUIPMENT, SYSTEMS AND TECHNIQUES FOR THE TAKEOFF, RECOVERY, MAINTENANCE, AND TEST OF AIRCRAFT.	
31125	3111	B	[SF]			AIRCRAFT SYS INTEGRAT LAB	Y	THIS FACILITY IS USED FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF VARIOUS GROUPINGS AND COLLECTIONS OF INTERACTING AIRCRAFT SYSTEMS SUCH AS THE EFFECTS OF AIRFRAME, STRUCTURE, FLIGHT CONTROL, ELECTRICAL, ENVIRONMENTAL CONTROL, FUEL, HYDRAULIC, MECHANICAL, PNEUMATIC, PROPULSION, GUN, LIFE SUPPORT AND RELATED GROUND SUPPORT SYSTEMS ON ECM, AIR TO AIR MISSILE LAUNCH, ETC.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
Buildings used directly in the research, development and testing of missiles, missile system, related ground handling, and launching equipment, and other aerospace equipment.									
31210	3121	B	[SF]			GUIDED MISSILE LAB	Y		THIS FACILITY IS USED IN SUPPORT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ADVANCE SIMULATION, INSTRUMENTATION, ENVIRONMENTAL TEST TECHNIQUES AND IMPROVED SERVICEABILITY AND RELIABILITY CHARACTERISTICS OF GUIDED MISSILE WEAPON SYSTEMS. IT INCLUDES ASSEMBLY, DISASSEMBLY, TEST MODIFICATION AND ANALYSIS OF TEST FIRING RESULTS OF GUIDED MISSILES.
31220	3121	B	[SF]			MISSILE SUPPORT EQUIP LAB	Y		THIS FACILITY IS USED FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF EQUIPMENT AND TECHNIQUES FOR THE LAUNCHING, RECOVERY, MAINTENANCE, TRANSPORT AND TESTING OF MISSILES AND GUIDED MISSILE SUPPORT EQUIPMENT.
31225	3121	B	[SF]			SPACECRAFT / SATELLITE LAB	Y		THIS FACILITY SUPPORTS RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF SPACECRAFT, SATELLITES OR COMPONENTS OF EACH NOT OTHERWISE CLASSIFIED AS A MISSILE WEAPON SYSTEM. THIS FACILITY WOULD INCLUDE RELATED GROUND SUPPORT/LAUNCHING EQUIPMENT.
31230	3121	B	[SF]			MISSILE SYS INTEGRAT LAB	Y		THIS FACILITY IS USED FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF RELATED AND INTERCONNECTED SYSTEMS THAT ARE NECESSARY FOR LAUNCHING, AND IN DIRECT SUPPORT OF GUIDED MISSILE SYSTEMS.
313						SHIP AND MARINE EQUIPMENT			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		

Facilities used directly in the research, development and testing of ships and marine equipment and tracked amphibious vehicles.

31310	3131	B	[SF]			SHIP AND MARINE LAB	Y	THIS FACILITY IS USED IN CONDUCTING RESEARCH, DEVELOPMENT, TEST AND EVALUATION ON SHIPS, BY USE OF MODELS IN HIGH AND LOW SPEED TOW TANKS, MANEUVERING AND SEAKEEPING BASINS, WATER TUNNELS, CIRCULATING WATER CHANNELS, FLUID PHENOMENON BASINS, ETC.
31320	3131	B	[SF]			SHIPS/MARINE EQUIPMENT LAB	Y	THIS FACILITY IS USED TO CONDUCT RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF SHIPS AND MARINE SUPPORT REQUIREMENT. THIS INCLUDES REPAIR AND MAINTENANCE EQUIPMENT AS WELL AS EQUIPMENT FOR DIRECT SUPPORT AND OPERATION OF SHIPS AND MARINE VESSELS SUCH AS PERISCOPES, TOWED ARRAYS, ETC.
31325	3131	B	[SF]			SHIPS/MAR SYS INTEGRAN LAB	Y	THIS FACILITY IS USED FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF RELATED AND INTERCONNECTED SHIPS AND MARINE SYSTEMS SUCH AS THE SHIP PLATFORM INTEGRATED WITH THE WEAPONS SYSTEMS, COMMUNICATION SYSTEMS, COMMAND AND CONTROL SYSTEMS, SURVEILLANCE SYSTEMS, NAVIGATION SYSTEMS, ETC.

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314 TANK AND  
AUTOMOTIVE

Facilities used directly in the research, development and testing of tank and other automotive equipment.

31410	3141	B	[SF]			GROUND TRANSPORT EQUIP LAB	Y	THIS FACILITY IS USED IN CONDUCTING RESEARCH, DEVELOPMENT, TEST AND EVALUATION IN THE FIELD OF AUTOMOTIVE DESIGN AS APPLIED TO TANKS, APC'S, AND RELATED MILITARY AUTOMOTIVE EQUIPMENT.
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315 WEAPONS AND  
WEAPON SYSTEMS

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
Facilities used directly in the research, development and testing of small arms, automatic weapons, mortars, artillery, guns, launchers, projectors (for arming ships, vehicles, and aircraft,) flame throwers, torpedo tubes, harbor protection, and non-electronic equipment. RDATE facilities for guided missiles and related items are included under Category Code series 312.									
31510	3151	B	[SF]			AIRCRAFT WEAPON SYS LAB	Y	THIS FACILITY SUPPORTS THE RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF AIRCRAFT WEAPON SYSTEMS INCLUDING PROJECTILES, MINES AND BOMBS, AND DEFENSIVE COUNTERMEASURES DEVICES/WEAPONS.	
31515	3151	B	[SF]			SHIP WEAPON SYSTEM LAB	Y	THIS FACILITY IS USED FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF WEAPONS AND WEAPON SYSTEMS DEPLOYED FROM A SURFACE SHIP. THIS WOULD INCLUDE GUNS, FIRE CONTROL, ETC. THIS DOES NOT INCLUDE AIRCRAFT OR MISSILE SYSTEMS.	
31520	3151	B	[SF]			UNDERWATER WEAPON SYS LAB	Y	THIS FACILITY IS USED FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF UNDERSEA WEAPONRY SUCH AS MINES AND TORPEDOES. THIS WOULD INCLUDE SUBMARINE MOUNTED GUNS BUT NOT SUBMARINE LAUNCHED MISSILES. KEY PLATFORM COMPONENTS INCLUDE SONAR, COMBAT CONTROL, UNDERWATER SUBMARINE WARFARE (USW) WEAPONS TARGETS, UNMANNED UNDERWATER VEHICLES (UUVS), AND FLEET TRAINING SYSTEMS.	
31525	3151	B	[SF]			GROUND WEAPON SYSTEM LAB	Y	THIS FACILITY IS USED FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF WEAPONRY IN USE ON OR DEPLOYED FROM A GROUND BASE PLATFORM AND WOULD INCLUDE SMALL ARMS, AUTOMATIC WEAPONS, MORTARS, ARTILLERY, FLAME THROWERS, ETC.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
31530	3151	B	[SF]			WEPS SYS INTEGRTN LAB	Y	THIS FACILITY IS USED TO ACCOMPLISH RESEARCH, DEVELOPMENT, TEST AND EVALUATION ASSOCIATED WITH THE INTEGRATION OF WEAPON SYSTEMS WITH THE WEAPONS PLATFORM AND WITH OTHER INTERFACES BETWEEN OTHER WEAPONS SYSTEMS, GUIDANCE SYSTEMS, SURVEILLANCE SYSTEMS, ETC.	
316						AMMO,EXPLOSIVES & TOXICS			
Facilities used directly in the research, development and testing of ammunition, rockets, bombs, mines, grenades, torpedoes, depth charges, demolition materials, pyrotechnics, ATO units, ammunition parts and related components and chemicals. This Category Code does not include facilities for guided missiles, guided bombs, or commercial type petroleum products.									
31610	3161	B	[SF]			AMMO,EXPLOSIVE & TOXIC LAB	Y	THIS FACILITY IS USED TO SUPPORT THE RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF AMMUNITION, ROCKETS, BOMBS, MINES, GRENADES, TORPEDOES, DEPTH CHARGES, DEMOLITION MATERIALS, PYROTECHNICS, ATO UNITS, RELATED CHEMICALS, AND THEIR COMPONENTS AND MATERIALS. THIS CATEGORY CODE DOES NOT INCLUDE FACILITIES FOR GUIDED MISSILES, GUIDED BOMBS, OR COMMERCIAL TYPE PETROLEUM PRODUCTS.	
317						ELECTRON,COMM & ELEC EQUIP			
Buildings used directly in the research, development and testing or radio and radar equipment, signal equipment, radiation aids, electrical equipment and its controls, transmitting and receiving equipment, avionics equipment, sonar, and guided bombs.									
31710	3171	B	[SF]			COMMUNICATIONS SYSTEM LAB	Y	THIS FACILITY IS USED IN CONDUCTING RESEARCH, DEVELOPMENT, TEST AND EVALUATION IN THE AREAS OF RADIO COMMUNICATION, INSTRUMENTATION, SATELLITE COMMUNICATION, ELECTROMAGNETIC PROPAGATION, RADIO ANTENNAS, UNDERWATER SOUND SYSTEMS, OPTICAL SYSTEMS (INFRARED), ETC.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
31715	3171	B	[SF]			DETECTION SYSTEMS LAB	Y	THIS IS USED IN CONDUCTING RESEARCH, DEVELOPMENT, TEST AND EVALUATION IN BASIC PHYSICAL PHENOMENA OF IMPORTANCE TO RADAR, SONAR, AND RELATED SENSORS, ALSO THE DEVELOPMENT OF SYSTEMS ANALYSIS AND EVAL. OF THE SENSORS USED IN SATELLITES, SHIPS, SUBMARINES, AND AIRCRAFT, ETC. IT INCLUDES SURVEILLANCE FOR DETECTION, IDENTIFICATION AND CLASSIFICATION OF SURFACE, AEROSPACE AND SUB-SURFACE OBJECTS.	
31720	3171	B	[SF]			ELEC & ELECTRONICS SYS LAB	Y	THIS FACILITY IS USED IN CONDUCTING RDT+E IN THE AREAS OF ELECTRICAL POWER AND ITS CONTROL, MAGNETIC FIELDS AND SHIP'S CONTROL SYSTEMS. RESEARCH IN THIS AREA INVOLVES DEVELOPMENT OF MOTORS AND GENERATORS, FREQUENCY CONVERTERS, VOLTAGE AND CURRENT CONTROL DEVICES, AND SHIPBOARD POWER DISTRIBUTION SYSTEMS.	
31725	3171	B	[SF]			ELEC/COMM SYS INTEGRAT LAB	Y	THIS FACILITY IS USED TO ACCOMPLISH RESEARCH, DEVELOPMENT, TEST AND EVALUATION ASSOCIATED WITH THE INTEGRATION OF RELATED SYSTEMS AND SUBSYSTEMS OF ELECTRICAL, ELECTRONICS AND COMMUNICATIONS SYSTEMS WITH THE PLATFORM (AIR, SEA, GROUND, ETC.) UPON WHICH THEY WILL OPERATE AND TO VERIFY INTERFACE CONSIDERATION WITH OTHER SYSTEMS OPERATING ON THE RESPECTIVE PLATFORM.	

## Category Code Report (All Series)

CATEGORY	FAC	RPA	UNITS OF MEASURE	RQMTS RPTG	TITLE	IND.	DESCRIPTION
CODE	CODE	TYPE	AREA OTHER ALT				

Facilities used directly to support research, development, testing and evaluation of propulsion hardware and appurtenances thereto and propellant type fuels.

31810	3181	B	[SF]		PROPULSION SYS LAB	Y	THIS FACILITY IS USED TO SUPPORT RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF PROPULSION SYSTEMS IN ORDER TO DETERMINE OPERATIONAL CAPABILITIES AND IN STUDYING THE ACOUSTICS AND ELECTROMAGNETIC NOISE EFFECTS ON PERFORMANCE AND EFFICIENCY OF DRIVE UNITS.
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31815	3181	B	[SF]		PROPULSION FUEL LAB	Y	THIS FACILITY IS USED TO SUPPORT RESEARCH, DEVELOPMENT, TEST, AND EVALUATION OF PROPULSION FUELS IN ORDER TO MAXIMIZE A PROPULSION SYSTEM'S OPERATIONAL CHARACTERISTICS. THIS FACILITY WOULD ALSO SUPPORT INVESTIGATION INTO NEW FUELS AND PROPULSIVE ENERGY SYSTEMS INCLUDING CONTROLLED NUCLEAR ENERGY.
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319					MISC ITEMS & EQUIP		
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Facilities used directly to support research, development, testing and evaluation of miscellaneous military equipment such as clothing, survival equipment, landing mats, military type bridging, hand tools, construction equipment, valves (e.g. safety, pressure reducing, fuel regulating), and hyperbaric facilities not appropriate in another category code, etc.

31910	3191	B	[SF]		MISC EQUIP & ITEMS LAB	Y	THIS FACILITY SUPPORTS RESEARCH, DEVELOPMENT, TEST, AND EVALUATION OF MISCELLANEOUS MILITARY EQUIPMENT SUCH AS LANDING MATS, VALVES (E.G. SAFETY, PRESSURE REDUCING, FUEL REGULATING), AND HYPERBARIC FACILITIES NOT APPROPRIATE IN ANOTHER CATEGORY CODE.
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31915	3191	B	[SF]		RDT&E STORAGE	Y	THIS BUILDING IS A STORAGE FACILITY FOR RESEARCH, DEVELOPMENT, TEST, AND EVALUATION EQUIPMENT AND MATERIALS DIRECTLY RELATED TO RDT&E PROGRAMS.
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## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
31920	3191	B	[SF]			CIVIL ENGINEERING LAB	Y	THIS FACILITY IS USED TO SUPPORT RESEARCH, DEVELOPMENT, TEST AND EVALUATION IN THE AREA OF CIVIL ENGINEERING. THIS WOULD INCLUDE MILITARY TYPE BRIDGING, HAND TOOLS, CONSTRUCTION EQUIPMENT, CONSTRUCTION TECHNIQUES, ON LAND, IN AND UNDER THE OCEAN.	
31925	3191	B	[SF]			HUMAN FACTORS LAB	Y	THIS FACILITY IS USED TO DETERMINE THE EFFECTS OF WARTIME ATMOSPHERE AND MATERIAL ON MILITARY PERSONNEL AND NON-COMBATANTS. THIS FACILITY WOULD ALSO DEAL WITH MAN-MAN INTERFACING (MORALE, COMMAND CONTROL, AND THE LIKE) AND MAN-MACHINE INTERFACING (CONSOLE DESIGN, PAYLOAD DESIGN, WORK AREA REQUIREMENTS, ETC.)	
31930	3191	B	[SF]			SURVIVAL EQUIP/CLOTHING LAB	Y	THIS FACILITY SUPPORTS RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF PILOT'S AND SAILOR'S NEED FOR SPECIAL EQUIPMENT, CLOTHING AND TECHNIQUES FOR SURVIVAL IN VARIOUS HOSTILE ENVIRONMENTS.	
31935	3191	B	[SF]			METROLOGY & CALIBRATION LAB	Y	THIS FACILITY WILL BE USED IN DIRECT SUPPORT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION PROGRAMS WHERE PRECISE WEIGHTS AND MEASURES ARE REQUIRED IN CALIBRATING RDT&E EQUIPMENT. THIS FACILITY WOULD INCLUDE THE METROLOGY AND CALIBRATION EQUIPMENT AND SPACE FOR CALIBRATING APPLICABLE EQUIPMENT.	
31940	3191	B	[SF]			RANGE OPERATOR & INSTR LAB	Y	THIS FACILITY IS USED IN SUPPORT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF RANGE OPERATIONS TO INCLUDE COMMAND CENTER, COMMUNICATIONS, SURVEILLANCE, INSTRUMENTATION, DATA COLLECTION/REDUCTION/DISPLAY, ETC.	
320						UNDERWATER EQUIPMENT			



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG	IND.	
Facilities used directly in the research, development and testing of underwater equipment.									
32010	3201	B	[SF]			UNDERWATER EQUIPMENT LAB	Y		THIS FACILITY IS USED IN CONDUCTING RESEARCH DEVELOPMENT, TEST AND EVALUATION OF UNDERWATER ACOUSTICS, SHIP VIBRATIONS AND VARIOUS TYPES OF UNDERWATER DEVICES TO INCREASE MAN'S CAPABILITIES IN THE OCEAN.
32020	3201	B	[SF]			UNDERWATER SYS INTEGRA LAB	Y		THIS FACILITY WILL BE USED FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF VARIOUS INTERACTING UNDERWATER SYSTEMS, EQUIPMENT, TOOLS, TECHNIQUES AND OPERATORS WORKING TOGETHER IN AN UNDERWATER ENVIRONMENT. THE INTEGRATION OF SEVERAL SYSTEMS TO ACCOMPLISH A GREATER TOTAL EFFORT WILL BE ACCOMPLISHED IN THIS FACILITY.
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321						TECHNICAL SERVICES			
Buildings used directly in RD&T manufacturing or reverse engineering of one-of-a-kind models and parts for systems or subsystems from wood, plastic, fiberglass and other materials by molding, casting, extruding and machining.									
32110	3211	B	[SF]			TECHNICAL SERVICES LAB	Y		BUILDINGS USED DIRECTLY IN RD&T MANUFACTURING OR REVERSE ENGINEERING OF ONE-OF-A-KIND MODELS AND PARTS FOR SYSTEMS OR SUBSYSTEMS FROM WOOD, PLASTIC, FIBERGLASS AND OTHER MATERIALS BY MOLDING, CASTING, EXTRUDING AND MACHINING.
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371						RANGE FACILITIES			
Structures used directly in research, development and testing of small arms, artillery, weapons systems, avionics, protection equipment, shelters,									
37110	3712	S	[EA]			SCIENCE SYS RANGE FACILITY	N		FACILITIES USED IN THE CONDUCT OF TESTS AND EVALUATIONS OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 310.
37111	3712	S	[EA]			AIRCRAFT SYS RANGE FACILITY	N		FACILITIES USED IN THE CONDUCT OF TESTS AND EVALUATIONS OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 311.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
37112	3712	S	[EA]			MISILE & SPACE SYS RGE FAC	N	FACILITIES USED IN THE CONDUCT OF TESTS AND EVALUATIONS OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 312.	
37113	3712	S	[EA]			SHIPS/MARINE SYS RANGE FAC	N	FACILITIES USED IN THE CONDUCT OF TESTS AND EVALUATIONS OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 313.	
37114	3712	S	[EA]			TANK & AUTO SYS RANGE FAC	N	FACILITIES USED IN THE CONDUCT OF TESTS AND EVALUATIONS OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 314.	
37115	3712	S	[EA]			WEAPONS/WEAP SYS RANGE FAC	N	FACILITIES USED IN THE CONDUCT OF TESTS AND EVALUATIONS OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 315.	
37116	3712	S	[EA]			AMMO,EXPLOSIVE & TOXIC FAC	N	FACILITIES USED IN THE CONDUCT OF TESTS AND EVALUATIONS OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 316.	
37117	3712	S	[EA]			ELEC,COMM/ELE SYS RNGE FAC	N	FACILITIES USED IN THE CONDUCT OF TESTS AND EVALUATIONS OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 317.	
37118	3712	S	[EA]			PROPULSION SYS RANGE FAC	N	FACILITIES USED IN THE CONDUCT OF TESTS AND EVALUATIONS OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 318.	
37119	3712	S	[EA]			MISC ITEM & EQUIP RNGE FAC	N	FACILITIES USED IN THE CONDUCT OF TESTS AND EVALUATIONS OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 319.	
37120	3712	S	[EA]			UNDERWATER SYS RANGE FAC	N	FACILITIES USED IN THE CONDUCT OF TESTS AND EVALUATIONS OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 320.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
Scientific structures and facilities other than buildings used directly in theoretical or applied research, development, and test operations related to such items as test tracks, wind tunnels, etc. Do not include structures and buildings used for normal maintenance, repair, and overhaul purposes.									
39010	3901	S		[EA]		SCIENCE SYSTEMS FACILITY	N		FACILITIES USED IN THE CONDUCT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 310.
39011	3901	S		[EA]		AIRCRAFT SYSTEMS FACILITY	N		FACILITIES USED IN THE CONDUCT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 311.
39012	3901	S		[EA]		MISSILE & SPACE SYSTEM FAC	N		FACILITIES USED IN THE CONDUCT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 312.
39013	3901	S		[EA]		SHIPS & MARINE SYSTEMS FAC	N		FACILITIES USED IN THE CONDUCT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 313.
39014	3901	S		[EA]		TANK @ AUTOMOTIVE SYS FAC	N		FACILITIES USED IN THE CONDUCT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 314.
39015	3901	S		[EA]		WEAPONS & WEAPONS SYS FAC	N		FACILITIES USED IN THE CONDUCT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 315.
39016	3901	S		[EA]		AMMO,EXPLOSIVES & TOXIC FAC	N		FACILITIES USED IN THE CONDUCT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 316.
39017	3901	S		[EA]		ELEC,COMM/ELE SYS RNGE FAC	N		FACILITIES USED IN THE CONDUCT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ITEMS IDENTIFIED UNDER CATEGORY CODE SERIES 317.
39018	3901	S		[EA]		PROPULSION SYSTEMS FAC	N		FACILITIES USED IN THE CONDUCT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ITEMS IDENTIFIED UNDER THE CATEGORY CODE SERIES 318.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
39019	3901	S	[EA]			MISC ITEMS & EQUIP FAC	N	FACILITIES USED IN THE CONDUCT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ITEMS IDENTIFIED UNDER THE CATEGORY CODE SERIES 319.	
39020	3901	S	[EA]			UNDERWATER SYSTEM FACILITY	N	FACILITIES USED IN THE CONDUCT OF RESEARCH, DEVELOPMENT, TEST AND EVALUATION OF ITEMS IDENTIFIED UNDER THE CATEGORY CODE SERIES 320.	
400						SUPPLY FACILITIES			
410						LIQUID STRG - FUEL/NONPRPL			
411						LIQUID FUEL STORAGE - BULK			
Depot, terminal, and bulk storage for POL, fuel oil, aviation gas, and other liquid fuel including accessory piping, fire protection and berns.									
41110	4111	S	[BL]			SHIP FUEL STR 10K-100K BL	Y	OPERATIONAL SHIP FUEL STORAGE TANKS WITH CAPACITIES BETWEEN 10K AND 100K BARRELS.	
41111	4112	S	[BL]			SHIP FUEL STRG > 100K BL	Y	BULK SHIP FUEL STORAGE TANKS ABOVE 100K BARREL CAPACITY.	
41112	4113	S	[BL]			CUT & COVER SHIP FUEL STRG	Y	SHIP FUEL STORAGE WITH EARTH COVER FOR USE IN POTENTIALLY HOSTILE ENVIRONMENTS.	
41120	4111	S	[BL]			AVTN FUEL STR 10K-100K BL	Y	OPERATIONAL AVIATION FUEL STORAGE TANKS WITH CAPACITIES BETWEEN 10K AND 100K BARRELS.	
41121	4112	S	[BL]			AVTN FUEL STRG > 100K BL	Y	BULK AVIATION FUEL STORAGE TANKS ABOVE 100K BARREL CAPACITY.	
41122	4113	S	[BL]			CUT & COVER AVTN FUEL STRG	Y	AVIATION FUEL STORAGE WITH EARTH COVER FOR USE IN POTENTIALLY HOSTILE ENVIRONMENTS.	
41130	4111	S	[BL]			DSL FUEL STR 10K-100K BL	Y	OPERATIONAL DIESEL FUEL STORAGE TANKS WITH CAPACITIES BETWEEN 10K AND 100K BARRELS.	
41131	4112	S	[BL]			DIESEL FUEL STRG > 100K BL	Y	BULK DIESEL FUEL STORAGE TANKS ABOVE 100K BARREL CAPACITY.	
41132	4113	S	[BL]			CUT& COVER DIESEL FUEL STR	Y	DIESEL FUEL STORAGE WITH EARTH COVER FOR USE IN POTENTIALLY HOSTILE ENVIRONMENTS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
41140	4111	S	[BL]			MTR GAS STRG 10K-100K BL	Y	OPERATIONAL MOTOR GASOLINE STORAGE TANKS WITH CAPACITIES BETWEEN 10K AND 100K BARRELS.	
41141	4112	S	[BL]			MOTOR GAS STRG > 100K BL	Y	MOTOR GASOLINE FUEL STORAGE TANKS ABOVE 100K BARREL CAPACITY.	
41142	4113	S	[BL]			CUT & COVER MOTOR GAS STRG	Y	MOTOR GASOLINE STORAGE WITH EARTH COVER FOR USE IN POTENTIALLY HOSTILE ENVIRONMENTS.	
41150	4111	S	[BL]			JET FUEL STRG 10K-100K BL	Y	OPERATIONAL JET FUEL STORAGE TANKS WITH CAPACITIES BETWEEN 10K AND 100K BARRELS.	
41151	4112	S	[BL]			JET ENGNE FL STR > 100K BL	Y	JET FUEL STORAGE TANKS ABOVE 100K BARREL CAPACITY.	
41152	4113	S	[BL]			CUT&CVER JET ENGN FUEL STR	Y	JET FUEL STORAGE WITH EARTH COVER FOR USE IN POTENTIALLY HOSTILE ENVIRONMENTS.	
41155	4114	S	[GA]			BULK/READY FUEL ADDTV STRG	N	STORAGE TANKS FOR FUEL ADDITIVES SUCH AS DEICING CHEMICALS.	
41160	1244	S	[BL]	GA		LIQ PETROLM FUEL GAS STRG	Y	THIS CATCODE IS FOR THE STORAGE OF LIQUEFIED PETROLEUM GAS, COMMONLY KNOWN AS LPG, FOR HEATING, METAL CUTTING, BRAZING, IN DENTAL LABORATORIES, ABOARD SHIPS, AND IN SIMILAR INSTALLATIONS. LPG CONSISTS PREDOMINANTLY OF PROPANE, PROPYLENE, WITH MINOR AMOUNTS OF BUTANE, ISOBUTENE, AND BUTYLENES.	
41182	4111	S	[BL]			CONTAMINATED FUEL STORAGE	Y	THIS CATCODE IS FOR FUEL STORAGE FACILITY TEMPORARY STORAGE FOR OFF-SPECIFICATION (CONTAMINATED) FUEL.	
41184	4111	S	[BL]			BULK HEATING FUEL STRG	Y	THIS CATCODE IS FOR HEATING FUEL OIL STORAGE FACILITIES AND IT MAY INCLUDE STORAGE TANKS FOR KEROSENE AND SEVERAL DIFFERENT GRADES OF DIESEL OIL.	
412						LIQUID STORG OTH/WTER, FUEL			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		

This group includes tank storage, accessories and piping for organic liquids such as cottonseed, linseed or soybean oils and other non-fuel liquids such as lubricants, ballast, or waste oils. Historical data should be available to determine rate of delivery and storage requirement. For waste liquids and oils, methods and schedule of disposals should be considered when determining storage requirement.

41215	4121	S		[GA]		ROAD OIL STORAGE	N	STORAGE FACILITIES FOR ROAD OIL. ROAD OIL IS OIL USED TO CONTROL DUST IN CERTAIN UNPAVED ROADWAY SITUATIONS.
41225	4121	S		[GA]		LUBRICANT STORAGE	N	THIS CATCODE IS FOR THE STORAGE OF LUBRICATING OIL.
41235	4121	S		[GA]		BALLAST AND SLUDGE STORAGE	N	THIS CATCODE IS FOR THE STORAGE OF BALLAST AND SLUDGE LIQUIDS.
41240	4121	S		[GA]		ORGANIC OIL STORAGE	N	THIS CATCODE IS FOR THE STORAGE OF ORGANIC OILS.
41245	4121	S		EA	[GA]	MISC LIQUID STORAGE	N	THIS CATCODE IS FOR THE STORAGE OF MISCELLANEOUS LIQUIDS.
41250	4121	S		[GA]		INDUS/POL WASTE STORGE FAC	N	THIS CATCODE IS FOR THE STORAGE OF INDUSTRIAL WASTE/POL LIQUIDS.

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420  
AMMUNITION STORAGE

Ammunition storage utilizes magazines, general purpose and refrigerated storehouses, tanks, open storage pads and associated stationary equipment for storage of Ammunition, Inert Ammunition Components, Liquid Propellants and Weapon-Related Batteries.

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421  
AMMUNITION STRG DEP/INSTLN

Above/underground ammunition and ammunition component magazines and storehouses (including their explosion barriers.)

42122	4211	B	[SF]		CF	HIGH EXPLOSIVE MAGAZINE	Y	A HIGH-EXPLOSIVE MAGAZINE IS USED FOR THE STORAGE OF HAZARD CLASS 1 DIVISION 1 (CH/D 1.1) ENERGETIC MATERIALS. EXAMPLES OF CH/D 1.1 MATERIALS ARE: BOMBS, MISSILES, WARHEADS, NAVAL MINES, DEMOLITION CHARGES. HC/D 1.3 AND 1.4 ENERGETICS MAY ALSO BE STORED IN A HIGH EXPLOSIVE MAGAZINE WHEN THE UTILIZATION REQUIRES IT AND COMPATIBILITY ALLOWS IT.
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## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
42132	4211	B	[SF]		CF	INERT STOREHOUSE	Y	THESE STOREHOUSES ARE USED FOR THE STORAGE OF SUCH NON-EXPLOSIVE ITEMS AS BOMB TAILS, MACHINE GUN LINKS, EMPTY CARTRIDGE CASES, AND PACKING MATERIALS.
42135	4221	B	[SF]		CF	READY MAGAZINE	Y	THIS CATEGORY CODE IS USED SPECIFICALLY FOR ORDNANCE REQUIRED TO BE STORED IN A READY SERVICE CAPACITY AND IS USED TO CAPTURE READY SERVICE MAGAZINES. THIS DOES NOT INCLUDE READY SERVICE LOCKERS AND SIMILAR ITEMS OF EQUIPMENT, WHICH ARE NOT CAPTURED IN INFADS.
42142	4211	B	[SF]		CF	SMOKEDRUM STOREHOUSE	Y	THIS CATCODE IS FOR THE STORAGE OF CHEMICAL AND SMOKE PRODUCING MIXTURES.
42148	4211	B	[SF]		CF	SMALL ARMS/PYROTECHNIC MAG	Y	THIS MAGAZINE MAY BE USED TO STORE CLASS 1 DIVISION 3 AND 4 AMMUNITION. PREDOMINANTLY SMALL ARMS AMMUNITION AND PYROTECHNICS.
42162	4211	B	[SF]		CF	SPECIAL WEAPONS MAGAZINE	Y	THE SPECIAL WEAPONS MAGAZINE IS SIMILAR TO THE HIGH EXPLOSIVE MAGAZINE BUT IS USED FOR THE STORAGE OF DIFFERENT TYPES OF ORDNANCE. FOR MORE DETAILS, REFER TO FC 2-000-05N.
42182	4211	B	[SF]			SUB BALLISTIC MSL STO FAC	Y	THIS CATCODE IS PRIMARILY FOR THE STORAGE OF SUBMARINE LAUNCHED BALLISTIC MISSILES
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422								
423	AMMUNITION STRG LIQ PRPLNT							
Facilities for receipt of bulk storage in tanks, and dispensing from storage of liquid propellants under explosive safety distances criteria including tanks, pipes, valves, valve chambers and similar appurtenant equipment and facilities.								
42310	4231	S	[GA]			LIQUID PROPELLANT STORAGE	Y	THIS CATCODE IS FOR THE STORAGE OF LIQUID PROPELLANTS
42320	1221	S		OL	[GM]	LIQ PROPELLANT DISPENS FAC	Y	THIS CATCODE IS FOR LIQUID PROPELLANT STORAGE AND DISPENSING FACILITIES

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
424						WPN-RELATED BATTERY STRG			
Weapon-related storage utilizes refrigerated warehouses that are capable of maintaining at least subfreezing temperatures. This code is not to be used for other cold storage facilities.									
42410	4241	B	[SF]	NS	SH	WPN-RELATED BATTERY STRG	Y		THIS CATCODE IS FOR FACILITIES RELATED TO THE STORAGE OF WEAPONS RELATED BATTERIES.
425						OPEN AMMUNITION STORAGE			
Includes open hardstands (pavements or prepared/stabilized surfaces) for ammunition storage and excludes all other hardstands.									
42510	4251	S	[SY]			OPEN AMMUNITION STRG PAD	Y		THIS CATCODE IS FOR FACILITIES RELATED TO AN OPEN AMMUNITION STORAGE PAD
42511	4251	S	[SY]			EXPLOSIVE STORAGE SITE PAD	N		A CONCRETE OR ASPHALT PAD, CONSTRUCTED AS A BASE ON WHICH TO PLACE NON-PERMANENT ORDNANCE STORAGE CONTAINERS SUCH AS READY SERVICE LOCKERS (RSLs) AND GOLANS. THE PADS CAN BE NEW OR A PORTION OF AN EXISTING PAVEMENT SUCH AS AN AIRCRAFT APRON OR SIMILAR.
42520	4251	S	[SY]			CONTAINR HOLDG YARD (EMPT)	Y		THIS CATCODE IS FOR FACILITIES RELATED TO AN EMPTY ISO CONTAINER- HOLDING YARD.
42530	4251	S	[SY]			BARRICADED MODULE	Y		A BARRICADED MODULE IS A BARRICADED AREA COMPRISING OF A SERIES OF CONNECTED CELLS WITH HARD SURFACE STORAGE PADS SEPARATED FROM EACH OTHER BY BARRICADES.
430						COLD STORAGE			
431						COLD STORAGE			



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
<p>Cold storage warehouses for preserving the quality of perishable foods and general supply materials that require refrigeration. The warehouse will include freeze and chill space and normal processing facilities and mechanical areas. The space requirements are applicable to cold storage facilities of all sizes whether built as separate structures or in conjunction with other buildings.</p>								
43110	4311	B	[SF]	TC	SH	COLD STORAGE WAREHOUSE	Y	A COLD STORAGE WAREHOUSE IS PLANNED TO PRESERVE THE QUALITY OF PERISHABLE FOODS AND GENERAL SUPPLY MATERIALS THAT REQUIRE REFRIGERATION. THE WAREHOUSE WILL INCLUDE FREEZE AND CHILL SPACE AND NORMAL PROCESSING FACILITIES AND MECHANICAL AREAS.
<hr/>								
432								
440	GENERAL SUPPLY BUILDINGS							
<p>This category group consists of supply-oriented covered storage and/or storage support facilities that are assigned to the Supply/Material Department or assigned for storage of operational mount-out stocks. Requirements allowance guidance can be found in the General Supply Planning Guidance under Requirements Determination.</p>								
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441	GEN SUPPLY STRG DEP/INSTLN							
<p>Navy buildings assigned to/required by Supply/Materials Departments including any space assigned for storage of operational mount-out stocks . 2. Marine Corps buildings required for storage of "out-of-stores" material, or organic mount out stocks. 3. Marine Corps buildings at activities designated as Remote Storage Activities (RSA), or Direct Support Stock Control activities. 4. Excludes buildings not assigned to the Supply/Material Department or for storage of operational mount-out stocks. also, excluded are facilities for operational hazardous flammable storage, storage of aircraft maintenance materials, storage of public works equipments and material, and commissary and exchange materials.</p>								
44110	4421	B	[SF]	TC	SH	GENERAL PURP WAREHOUSE	Y	THIS CODE INCLUDES GENERAL WAREHOUSES WITH THE FOLLOWING CHARACTERISTICS: HEATED OR UNHEATED AND WITH/WITHOUT HEAVY-DUTY (OVERHEAD CRANE) CAPABILITY, SPRINKLER SYSTEMS AND/OR ALARM SYSTEMS.
44111	4421	B	[SF]	TC	SH	GENERAL WAREHOUSE MARCORPS	Y	THIS CATEGORY CODE INCLUDES REQUIREMENTS FOR MARINE CORPS GROUND ACTIVITIES WHICH HAVE BEEN DESIGNATED BY MARINE CORPS ORDERS AS DIRECT SUPPORT STOCK CONTROL ACTIVITIES OR WHICH HAVE SPECIALIZED DSSC FUNCTIONS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
44112	4421	B	[SF]	TC	SH	STG AIR/GRD ORG UTS MARCOR	Y	THIS CATEGORY CODE INCLUDES GENERAL PURPOSE STORAGE FACILITIES ASSIGNED TO MARINE CORPS BASES, AIR INSTALLATIONS AND FLEET MARINE FORCE (FMF) UNITS FOR ORGANIC REQUIREMENTS TO INCLUDE DIVISION/WING, BATTALION/GROUP AND COMPANY/SQUADRON STORAGE AREAS, SPECIAL SERVICE STOREROOMS, BASE SHIPPING AND RECEIVING FUNCTIONS AND ANY OTHER ORGANIC STORAGE REQUIREMENTS.	
44113	4411	B	[SF]	TC	SH	MARCOR LOGSUPBASE WRHSE	Y	THIS FACILITY INCLUDES GENERAL- PURPOSE WAREHOUSES DESIGNATED AS STORAGE AREAS FOR MARINE CORPS OWNED MATERIAL IN SUPPORT OF LOGISTIC SUPPORT BASE MISSION AS INTEGRATED MATERIAL MANAGERS. ALSO INCLUDED IS THE SPACE UTILIZED IN SUPPORT OF PRE-POSITIONED WAR RESERVE STOCKS.	
44114	4411	B	[SF]	TC	SH	MARCOR SASSY WAREHOUSE	Y	THIS FACILITY INCLUDES GENERAL- PURPOSE WAREHOUSES DESIGNATED FOR SUPPORT OF THE SUPPORTED ACTIVITY SUPPLY SYSTEM (SASSY) MANAGEMENT UNITS TO INCLUDE GENERAL AND MOUNT OUT ACCOUNTS AND CONSOLIDATED ISSUE POINT ASSETS.	
44120	4424	B	[SF]	TC	SH	CONTROLLED HUMIDITY WRHSE	Y	A CONTROLLED HUMIDITY WAREHOUSE IS SIMILAR TO A GENERAL WAREHOUSE (441 10) IN EVERY RESPECT EXCEPT THAT IT IS CONSTRUCTED WITH APPROPRIATE VAPOR BARRIERS AND CONTAINS HUMIDITY CONTROL EQUIPMENT TO MAINTAIN HUMIDITY AT DESIRED LEVELS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
44130	4423	B	[SF]	TC	SH	HAZARDOUS/FLAMMA BL STRHSE	Y	A HAZARDOUS MATERIALS WAREHOUSE IS REQUIRED FOR THE STORAGE AND HANDLING OF MATERIALS SUCH AS FLAMMABLE AND COMBUSTIBLE LIQUIDS, ACIDS, ETC. AS SAFE STORAGE OF SUCH MATERIALS LIES IN THEIR SEPARATION FROM INCOMPATIBLE MATERIALS, A HAZARDOUS AND FLAMMABLES STOREHOUSE IS REQUIRED AS MUCH FOR ADEQUATE MATERIAL SEPARATION AS FOR THEIR STORAGE AND HANDLING.
44135	4422	S	[SF]	TC	SH	GENERAL STORAGE SHED	Y	THE GENERAL SHED IS A ROOFED STRUCTURE WITHOUT COMPLETE SIDE AND/OR END WALLS AND WITH OR WITHOUT SPRINKLER AND/OR ALARM SYSTEMS.
44140	4421	B	[SF]	TC	SH	UNDERGROUND STORAGE	Y	THIS CATEGORY CODE PERTAINS TO UNDERGROUND STORAGE; WHERE IT IS NECESSARY, BECAUSE OF POTENTIAL SABOTAGE OR ENEMY ACTION TO PROTECT SUPPLIES EITHER BY DISPERSAL OR PROTECTIVE CONSTRUCTION, INSTEAD OF PROGRAMMING NEW PROTECTIVE CONSTRUCTION, EXISTING MINES MAY BE USED.
44170	4421	B	[SF]	NS	SH	DISPOSL/SALVAGE/ SCRAP BLDG	Y	THIS FACILITY IS PRIMARILY TO PROVIDE COVERED SPACE FOR THE RECEIPT, PROCESSING, STAGING AND ISSUE OF MATERIAL THAT HAS BEEN DEEMED EXCESS TO NAVY NEEDS AND IS AWAITING SOME RESALE OR FINAL DISPOSAL.
44171	4421	B	[SF]	TC	SH	INTEGRATE LOG OH & OUTFIT	Y	THIS FACILITY PROVIDES COVERED SUPPLY SPACE USED FOR PROCESSING MATERIALS OFFLOADED FROM OR ASSEMBLED FOR LOADING ABOARD SHIPS. IT INCLUDES SPACE REQUIRED FOR RECEIVING, SORTING, IDENTIFYING AND PROCESSING MATERIALS OFF-LOADED AS WELL AS PROCESSING AND ASSEMBLY OF OUTFITTING MATERIALS TO BE LOADED ABOARD FLEET UNITS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
44172	4421	B	[SF]	TC	SH	SERVMART	Y	A SERVMART PROVIDES COVERED SUPPLY FACILITIES USED FOR DISPLAY AND SALE OF SUPPLY SYSTEMS MATERIALS FOR SELF-SERVICE REQUISITIONING BY END USERS. IT INCLUDES AREAS USED TO DISPLAY ITEMS ON SHELVES OR GONDOLAS, CHECKOUT COUNTERS AND ADMINISTRATIVE FUNCTIONS.	
44173	4421	B	[SF]	TC	SH	MTIS BUILDING	Y	A MATERIAL TURNED INTO STORE (MTIS) FACILITY PROVIDES COVERED SUPPLY SPACE USED FOR PROCESSING MATERIALS TURNED INTO SUPPLY FOR REDISTRIBUTION OR DISPOSAL. IT INCLUDES SPACE USED FOR RECEIPT, SCREENING, IDENTIFICATION, ASSEMBLY AND STAGING FOR RETURN TO STORAGE AREAS.	

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442									
450						STORAGE OPEN			
451						STORAGE-OPEN DEPOT/INSTLN			

This category group consists of non-covered storage areas, paved or otherwise established, for storage of General Supply Materials. Several of the excluded types of functions include miscellaneous materials coded under other basic category codes (e.g., ammunition on open pad coded under 425-10 and open storage areas for non-supply oriented functions coded under 852-35). This code also refers to open areas primarily to provide space for the receipt, processing, staging and issue of material that has been deemed excess to Navy needs and is awaiting some resale or final disposal and whose value is not significantly impacted by uncovered exposure to the environment. This code may also be used for such open yards required for staging or storage of items being held for their scrap value to ongoing missions or systems.

45110	4521	S	[SY]	NS		OPEN STORAGE AREA	Y	THIS CATEGORY GROUP CONSISTS OF NON-COVERED STORAGE AREAS, PAVED OR OTHERWISE ESTABLISHED, FOR STORAGE OF GENERAL SUPPLY MATERIALS.
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## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
45170	4521	S	[SY]	NS		EXTRAORDY SUP DISPL STG AR	Y	THIS CODE REFERS TO OPEN AREAS PRIMARILY TO PROVIDE SPACE FOR THE RECEIPT, PROCESSING, STAGING AND ISSUE OF MATERIAL THAT HAS BEEN DEEMED EXCESS TO NAVY NEEDS AND IS AWAITING SOME RESALE OR FINAL DISPOSAL AND WHOSE VALUE IS NOT SIGNIFICANTLY IMPACTED BY UNCOVERED EXPOSURE TO THE ENVIRONMENT.	
<hr/>									
452									
500	HOSPITAL-MEDICAL FACILITY								
<hr/>									
510	MEDICAL CENTER/HOSPITAL								
<p>Facilities that provides general and specialized medical care for authorized personnel, with both inpatient and outpatient services. This facility will also normally contain clinics, such as Medical, surgical, pediatrics, obstetrical, ICU and CCU. The facility will have a Pharmacy, ambulance, and administrative area. This facility will admit for more than 24-hour stay.</p>									
51010	5100	B	SF	[BD]	LC	HOSPITAL	Y	A HEALTHCARE FACILITY THAT PROVIDES GENERAL AND SPECIALIZED MEDICAL CARE FOR AUTHORIZED PERSONNEL, WITH BOTH INPATIENT AND OUTPATIENT SERVICES. THIS FACILITY WILL ALSO NORMALLY CONTAIN CLINICS, SUCH AS MEDICAL, SURGICAL, PEDIATRICS, OBSTETRICAL, ICU AND CCU.	
51011	5100	B	[SF]	LC	BD	MEDICAL CENTER	Y	A REGIONAL MEDICAL CENTER. THESE FACILITIES SUPPORT BOTH INCREASED SURGICAL CAPABILITIES AND A SURGICAL GRADUATE EDUCATION PROGRAM, NOT REQUIRED IN SMALLER HOSPITALS. APPLIES TO BETHESDA, PORTSMOUTH AND SAN DIEGO (BALBOA).	
51012	5306	B	SF	[EA]		PREPOS FLT HOSP WAREHOUSE	Y	FLEET (DEPLOYABLE) HOSPITAL STORAGE FACILITY.	
51015	5100	B	SF	[BD]	LC	HOSPITAL BR/ANEX	Y	HOSPITAL FACILITY ASSOCIATED WITH A MAIN HOSPITAL BUT IN A SEPARATE LOCATION.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG IND.	DESCRIPTION
			AREA	OTHER	ALT			
51016	6100	B	[SF]			MEDICAL ADMIN	Y	ADMINISTRATIVE FUNCTIONS ASSOCIATED WITH A HOSPITAL OR MEDICAL CENTER. CAN BE WITHIN A MEDICAL FACILITY ITSELF, OR IN A STANDALONE ADMIN FACILITY ASSOCIATED WITH A HOSPITAL OR MEDICAL CENTER.
51020	5100	B	[SF]			HOSPITAL LAUNDRY	Y	LAUNDRY FACILITIES LOCATED WITHIN A HOSPITAL (CATCODE 510 10), USED FOR LAUNDERING OF HOSPITAL LINENS AND OTHER NECESSARY ITEMS.
51077	5306	B	[SF]			HOSPITAL/MED STRG(MISC)	Y	SPACE USED FOR STORAGE OF MEDICAL SUPPLIES WITHIN THE HOSPITAL FACILITY.
530			LABORATORIES					
Laboratory, veterinary, preventive medicine and other ancillary facilities.								
53010	5500	B	[SF]			DISP & OUT PATIENT CLINIC	Y	FREE STANDING CLINIC, OUTPATIENT CLINIC, WHICH OCCUPIES A BUILDING OR PART OF A BUILDING, BUT IS NOT PHYSICALLY LOCATED WITH A HOSPITAL OR MEDICAL CENTER THAT PROVIDES ROUTINE AND EMERGENCY CARE TO AUTHORIZED PERSONNEL.
53020	5302	B	[SF]			MEDICAL LABORATORY	Y	A FACILITY, DETACHED FROM A HOSPITAL THAT PROVIDES LABORATORY SUPPORT TO THE HOSPITAL AND/OR OTHER MEDICAL ACTIVITIES. THE ANALYSIS AND DIAGNOSTIC LABORATORY INCLUDES CHEMISTRY, DIAGNOSTICS AND MICROBIOLOGY TESTING SECTIONS AND A QUALITY ASSURANCE AND TECHNICAL SUPPORT SECTION.
53025	5500	B	[SF]			NAVY MEDICAL PHARMACY	Y	A DETACHED FACILITY THAT PROVIDES ROUTINE AND EMERGENCY HEALTH CARE TO AUTHORIZED PERSONNEL.
53030	5303	B	[SF]			MORGUE	Y	A FACILITY, EITHER DETACHED OR WITHIN A HOSPITAL, FOR THE IDENTIFICATION, PREPARATION, AND HOLDING OF HUMAN REMAINS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
53040	5304	B	[SF]			VIVARIUM CLINIC	Y	THE VIVARIUM CLINIC IS A MEDICAL RESEARCH LABORATORY FOR KEEPING AND RAISING ANIMALS AND PLANTS UNDER NATURAL CONDITIONS FOR OBSERVATION AND RESEARCH.	
53045	5304	B	[SF]	EA		VET TREATMENT FAC	Y	THIS FACILITY IS USED TO PROVIDE FOOD SAFETY AND QUALITY ASSURANCE, CARE FOR GOVERNMENT OWNED ANIMALS (WORKING DOGS AND HORSES), AND ANIMAL DISEASE PREVENTION AND CONTROL. VETERINARY SERVICES ARE TO EXAMINE, IMMUNIZE AND TREAT FOR THE PREVENTION AND CONTROL OF DISEASES OR CONDITIONS THAT ARE TRANSMISSIBLE TO HUMANS OR ANIMALS, OR MAY CONSTITUTE A MILITARY COMMUNITY HEALTH PROBLEM.	
53050	5302	B	[SF]			ENVIRONMNTL PREVNTV MED LB	Y	MEDICAL LABORATORY OPERATING IN SUPPORT OF A HOSPITAL OR MEDICAL CENTER.	
53060	5306	B	[SF]			MEDICAL WAREHOUSE	Y	A STORAGE FACILITY FOR MEDICAL EQUIPMENT AND SUPPLIES THAT IS CONTINUOUSLY WITHDRAWN AND REPLENISHED. STORAGE OF WAR RESERVE MEDICAL SUPPLIES IS INCLUDED IN DEPOT STORAGE FACILITIES.	
53070	5307	B	[SF]			AMBUL SHELTER	Y	A COVERED SPACE USED TO SHIELD THE AMBULANCE, ITS DRIVER AND ITS PATIENTS FROM EXPOSURE TO THE ELEMENTS.	

540

### DENTAL CLINICS

A dental clinic is an oral health care service facility equipped and staffed to perform dental procedures for general practices, a specialty, or a grouping of specialties. A dental facility will normally include treatment areas, administrative, support and storage areas.

54010	5400	B	SF	[OU]		DENTAL CLINIC	Y	A DENTAL CLINIC IS AN ORAL HEALTH CARE SERVICE FACILITY EQUIPPED AND STAFFED TO PERFORM DENTAL PROCEDURES FOR GENERAL PRACTICES, A SPECIALTY, OR A GROUPING OF SPECIALTIES.
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## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
550						DISPENSARIES/CLINICS			
Facilities primarily intended to provide emergency treatment and ambulatory services. A primary care clinic may be referred by various names (troop medical clinic, adult clinic, family practice clinic, OCC Health, Outpatient, and others). A primary care clinic provides the office, examination and treatment space for primary care managers.									
55010	5500	B	[SF]			PRIM CARE CLINIC	Y		A PRIMARY CARE CLINIC MAY BE REFERRED BY VARIOUS NAMES (TROOP MEDICAL CLINIC, ADULT CLINIC, FAMILY PRACTICE CLINIC, OCC HEALTH, OUTPATIENT, AND OTHERS). A PRIMARY CARE CLINIC PROVIDES THE OFFICE, EXAMINATION AND TREATMENT SPACE FOR PRIMARY CARE MANAGERS.
55020	5501	B	[SF]		BD	AMBULATORY CARE CENTER	Y		A HEALTH CARE FACILITY CAPABLE OF PERFORMING OUTPATIENT SURGICAL PROCEDURES AND OTHER MEDICAL TREATMENT, NOT REQUIRING EXTENSIVE PATIENT CONVALESCENCE OR OVERNIGHT OBSERVATION.
55030	5500	B	[SF]			SUBSTANCE ABUSE REHAB PRGM	Y		THIS FACILITY WILL PROVIDE THE NECESSARY ADMINISTRATION, COUNSELING, TRAINING, BERTHING, AND RECREATION FOR REHABILITATION OF ELIGIBLE NAVY, MARINE CORPS AND OTHER PERSONNEL SUFFERING FROM ALCOHOLISM, DRUG DEPENDENCY AND/OR COMPULSIVE OVEREATING.
552						AMBU CARE CLINICS			
A health care facility capable of performing outpatient surgical procedures and other medical treatment, not requiring extensive patient convalescence or overnight observation.									
600						ADMINISTRATIVE FACILITIES			
610						ADMIN BUILDINGS			



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
<p>These are headquarters and office-type buildings accommodating administrative and professional activities, business and data-processing machines, records, files, and administrative supplies for normal operations. For bulk storage of administrative records and supplies, see the 400 series.</p>									
61010	6100	B	[SF]			ADMINISTRATIVE OFFICE	Y	THIS FACILITY ACCOMMODATES THE EXECUTIVE AND STAFF FUNCTIONS OF THE STATION OR OF A PARTICULAR DEPARTMENT. THE FUNCTIONS PERFORMED IN AN ADMINISTRATIVE OFFICE ARE PRIMARILY LOGISTICAL AND PERSONNEL MANAGEMENT AS DISTINGUISHED FROM TACTICAL AND STRATEGIC ACTIVITIES.	
61030	6100	B	[SF]		PH	CLASSMATTER INCINERTR BLD	Y	A STAND ALONE FACILITY SOLELY FOR THE PURPOSE OF DESTRUCTION OF CLASSIFIED MATERIALS EITHER THROUGH INCINERATION OR SHREDDING.	
61040	6100	B	[SF]			LEGAL SERVICES FACILITY	Y	NAVAL LEGAL SERVICE OFFICES (NLSO), REGIONAL LEGAL SERVICE OFFICES (RLSO), JUDICIARY OFFICES, AND CLAIMS CENTERS PROVIDE COMPREHENSIVE LEGAL SERVICES TO COMMAND AND INDIVIDUAL CLIENTS. THESE SERVICES INCLUDE SAFE AND SECURE TRIALS BY COURT-MARTIAL, ADMINISTRATIVE DISCHARGE PROCEEDINGS AND OTHER PERSONNEL ACTIONS, ADJUDICATION OF CLAIMS, LEGAL ASSISTANCE, AND COMMAND ADVICE.	
61050	6100	B	[SF]			AUSTERE ADMIN FACILITY	Y	AUSTERE ADMIN. FACILITIES ACCOMMODATE THE EXECUTIVE AND STAFF FUNCTIONS AT DESIGNATED AUSTERE NAVAL INSTALLATIONS. THE FUNCTIONS PERFORMED IN AN ADMIN. OFFICE ARE PRIMARILY LOGISTICAL AND PERSONNEL MANAGEMENT. THEY ARE INTENDED TO PROVIDE THE MINIMUM FOOTPRINT AREA AND FINISH SUPPORTING ADMIN. FUNCTIONS WHILE PROVIDING MINIMAL UP FRONT AND TOTAL COSTS IN COMPARISON TO NON-AUSTERE FACILITIES.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
61070	6102	B	[SF]			DIVISION/WING HQ (MARCOR)	Y	THIS CATEGORY CODE IS FOR A FLEET MARINE FORCE (FMF) FACILITY AND PROVIDES THE NECESSARY ADMINISTRATIVE SPACE TO CONDUCT THE DAY-TO-DAY OPERATIONS OF A MARINE DIVISION HEADQUARTERS OR A MARINE AIRCRAFT WING HEADQUARTERS.
61071	6102	B	[SF]			REGMT/GROUP HQ (MARCOR)	Y	THIS CATEGORY CODE IS FOR A FLEET MARINE FORCE (FMF) FACILITY AND PROVIDES THE NECESSARY ADMINISTRATIVE SPACE TO CONDUCT THE DAY-TO-DAY OPERATIONS OF A MARINE REGIMENTAL HEADQUARTERS OR A MARINE AIRCRAFT GROUP HEADQUARTERS.
61072	6102	B	[SF]			BATTLN SQUADRN HQ (MARCOR)	Y	THIS CATEGORY CODE IS FOR A FLEET MARINE FORCE (FMF) FACILITY AND PROVIDES THE NECESSARY ADMINISTRATIVE SPACE TO CONDUCT THE DAY-TO-DAY OPERATIONS OF A MARINE BATTALION OR A SQUADRON HEADQUARTERS.
61073	6101	B	[SF]			COMPANY/BATTERY HQ(MARCOR)	Y	THE CATEGORY CODE IS FOR A FLEET MARINE FORCE (FMF) FACILITY AND IS INTENDED FOR THOSE FMF UNITS OF COMPANY OR BATTERY SIZE WHICH REQUIRE SEPARATE ADMINISTRATIVE FACILITIES.
61074	6102	B	[SF]			GARRISON AID STA, MARCOR	Y	A GARRISON AID STATION PROVIDES MEDICAL CARE AT THE LOCAL LEVEL FOR THE MARINE CORPS AND GENERALLY WILL BE COLLOCATED WITH THE BATTALION AND REGIMENTAL HQ FACILITIES. THE FUNCTIONS PERFORMED IN THIS FACILITY ARE BOTH ADMIN AND CLINICAL IN NATURE WHICH REQUIRES SPACE FOR THE MEDICAL PERSONNEL ASSIGNED AT THE BATTALION, SQUADRON, AND REGIMENTAL LEVELS TO WORK AND SPACE FOR MEDICAL FILE STORAGE.
61077	6100	B	[SF]			ADMIN STORAGE (MISC)	Y	STORAGE FACILITIES FOR MISCELLANEOUS EQUIPMENT OR GOODS RELATED TO ADMINISTRATIVE FACILITY SUPPORT.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
620						ADMIN FACILITIES UNDERGRND			
62010	6200	B	[SF]			ADMIN FACILITY UNDERGROUND	Y		UNDERGROUND ADMINISTRATIVE FACILITY, UTILIZED WHERE SECURITY PROVIDED BY UNDERGROUND LOCATION IS WARRANTED AND APPROVED BY HIGHER HEADQUARTERS.
62077	6200	B	[SF]			UNDERGRND ADMIN STRG(MISC)	Y		UNDERGROUND ADMINISTRATIVE STORAGE FACILITY, UTILIZED WHERE SECURITY PROVIDED BY UNDERGROUND LOCATION IS WARRANTED AND APPROVED BY HIGHER HEADQUARTERS.
690						OTHER ADMINISTRATIVE FAC			
Miscellaneous administrative facilities not included in the 610 and 620 category code series. Excludes community facilities coded in the 700 category code series, and all facilities coded in the 800 series.									
69010	6900	S		[EA]		FLAGPOLE/BILLBD/ MARKER	N		NO PLANNING FACTORS ARE AVAILABLE. PROVIDE FACILITIES AS REQUIRED.
69015	6900	S		[EA]		SALUTING BATTERY GUN MOUNT	N		NO PLANNING FACTORS ARE AVAILABLE. PROVIDE FACILITIES AS REQUIRED.
69025	6900	S		[EA]		REVIEWING STAND	N		NO PLANNING FACTORS ARE AVAILABLE. PROVIDE FACILITIES AS REQUIRED.
69030	6900	S		[EA]	PH	CLAS MATERIAL INCIN/NO BLD	N		A FACILITY SIMILAR TO 610 30, THAT IS LOCATED INSIDE ANOTHER BUILDING INSTEAD OF A STAND ALONE STRUCTURE.
700						HOUSING AND COMMUNITY FAC			
710						FAMILY HOUSING			
711						FAMILY HOUSING- DWELLINGS			
Buildings to be used as family quarters including attached private garages.									
71120	7110	B	SF	[FA]	NF	WHERRY HSG	N		WHERRY HOUSING, ALL RANKS
71125	7110	B	SF	[FA]	NF	CAPEHT HSG	N		CAPEHART HOUSING, THRU 06.
71129	7110	B	SF	[FA]	NF	CAPEHT HSG, O- 7/O-10	N		CAPEHART HOUSING, 07-010.
71130	7110	B	SF	[FA]	NF	FAM HSG THRU 06	N		FAMILY HOUSING THRU 06
71134	7110	B	SF	[FA]	NF	FAM HSG 07 - 010	N		FAMILY HOUSING 07 - 010

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
71135	7110	B	SF	[FA]	NF	LEASED HSG	N	LEASED HOUSING THRU 06	
71139	7110	B	SF	[FA]	NF	LEASED HSG,O-7/O-10	N	LEASED HOUSING, 07-010.	
71145	7120	B	SF	[FA]	NF	RELOCATABLE HSG	N	RELOCATABLE HOUSING, ALL RANKS.	
71150	7110	B	SF	[FA]	NF	SURP COMMDTY HSG	N	SURPLUS COMMODITY HOUSING, ALL RANKS.	
71155	7110	B	SF	[FA]	NF	FOREIGN SOURCE HSG THRU 06	N	FOREIGN SOURCE HOUSING THRU 06	
71159	7110	B	SF	[FA]	NF	FOR 'N SOURCE HSG,O-7/O-10	N	FOREIGN SOURCE HOUSING, 07-010.	
712						SUBSTNRD TRAILERS-FAM HSG			
Mobile homes with government ownership are an emergency expedient. They are not considered in basic planning.									
713						FAMILY HOUSING-TRAILR SITE			
Single and/or double wide manufactured housing parking sites with appurtenant utility connections; roads; walks; storage sheds; laundry and community buildings; and recreational facilities.									
71311	7130	LS	SY	[FA]	SI	TRAILER SITE,PRVT TRAILERS	N	THIS GROUP INCLUDES SINGLE AND/OR DOUBLE WIDE MANUFACTURED HOUSING PARKING SITES WITH APPURTENANT UTILITY CONNECTIONS; ROADS; WALKS; STORAGE SHEDS; LAUNDRY AND RECREATIONAL FACILITIES.	
714						FAMILY HOUSING-DETACHD FAC			
Detached facilities are structures separated from family quarters, but available to the occupants.									
71410	7141	B	[SF]	VE		DETACHED GARAGES	N	DETACHED GARAGES ARE BUILDINGS SEPARATED FROM FAMILY QUARTERS, BUT AVAILABLE TO THE OCCUPANTS.	
71420	7147	S	[SF]	VE		DETACHED CARPORTS	N	DETACHED CARPORTS ARE ALSO PROVIDED ON THE BASIS OF ONE PER LIVING UNIT AND A SPACE ALLOWANCE OF ONE VEHICLE PER CARPORT.	
71430	7143	B	[SF]			FAMILY HSG OTHER DET BLDG	N	THESE CODES ARE FOR INVENTORY PURPOSES ONLY AND ARE TO BE USED FOR MINOR DETACHED BUILDINGS DIRECTLY RELATING TO A PARTICULAR FAMILY DWELLING.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
71431	7143	B	SF	[EA]		FAMILY HSG OTHER DET FAC	N	THESE CODES ARE FOR INVENTORY PURPOSES ONLY AND ARE TO BE USED FOR MINOR DETACHED FACILITIES DIRECTLY RELATING TO A PARTICULAR FAMILY DWELLING.	
71432	7440	B	[SF]			COMMUNITY CENTER	N	A FAMILY HOUSING COMMUNITY CENTER (FHCC) PROVIDES SPACE FOR SOCIAL AND RECREATIONAL PROGRAMS AT FAMILY HOUSING PROJECTS WHERE COMPARABLE NAVY OR NON-NAVY FACILITIES ARE NOT REASONABLY ACCESSIBLE.	
71433	6100	B	[SF]			HOUSING WELCOME CTR (HWC)	N	A FAMILY HOUSING WELCOME CENTER (HWC) PROVIDES SPACE FOR ADMINISTRATIVE AND SERVICE FUNCTIONS ASSOCIATED WITH THE PROVISIONS OF GOVERNMENT AND PRIVATE SECTOR HOUSING. THE ESTABLISHMENT OF A HWC MUST BE AUTHORIZED BY DIRECTOR, SHORE READINESS DIVISION (OPNAV N46) OR COMMANDANT OF THE MARINE CORPS (LFF-3).	
71477	7142	B	[SF]			HOUSING,MISC STRG	N	STORAGE FACILITIES IN SUPPORT OF FAMILY HOUSING.	
720						UNACOMP PERSONNEL HOUSING			
721						UNACOMP PERS HOUS-ENL PERS			
<p>Unaccompanied Enlisted Quarters refers to apartment style, hotel style, dormitory style living quarters and the open bay barracks for recruits. If messing facilities are attached, use category code numbers 721-11 through 721-40 for the quarters portion as appropriate and category code number 721-45 for the mess hall portion. For detached mess halls, use category group 722.</p>									
72111	7210	B	SF	[PN]		UNACC ENL HSG	Y	UNACCOMPANIED ENLISTED HOUSING	
72114	7213	B	SF	[PN]		STUDENT BARRACKS	Y	UNACCOMPANIED QUARTERS FOR 'A' SCHOOL STUDENTS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
72115	7218	B	SF	[PN]		RECRUIT BARRACKS	Y	OPEN BAY DESIGN BARRACKS. THESE WILL BE CONSTRUCTED ONLY FOR RECRUITS, RECEIVING BARRACKS, AND USMC SCHOOL OF INFANTRY. RECRUIT QUARTERS ARE OPEN BAY, CENTRAL HEAD FACILITIES WITH NET LIVING AREA SIZED AS ONE EQUAL SHARE OF THE OPEN BAY SLEEPING AREA.	
72127	7212	B	[SF]			AUSTERE QTRS MISSION ESSN	Y	AUSTERE QUARTERS ARE LODGING FACILITIES LOCATED AT DESIGNATED ENDURING NAVAL INSTALLATIONS. THE CURRENT AUSTERE FACILITY GUIDANCE PROVIDES FOR STANDARDIZED ROOM MODULES WITH CENTRALIZED SHOWER/TOILET FACILITIES FOR ACTIVE DUTY PERSONNEL AND RESERVISTS.	
72140	7312	B	SF	[PN]		DISCIPLINARY HOUSING	Y	THIS FACILITY IS TO BE USED FOR BERTHING PERSONNEL IN DISCIPLINARY HOLDING OF RESTRICTED STATUS.	
72141	7214	B	[SF]	PN		UDP HOUSING M.E.(ENLISTED)	Y	UNIT DEPLOYMENT PROGRAM (UDP) PERSONNEL HOUSING FOR MISSION ESSENTIAL (ENLISTED)	
72145	7220	B	SF	[PN]		GALLEY/MESS BUILT-IN/ATTD	Y	A FACILITY, WITH CAFETERIA STYLE DINING OPERATIONS, FOR UNACCOMPANIED PERSONNEL AND OTHER AUTHORIZED PERSONS THAT IS BUILT INTO OR ATTACHED TO THE UH.	
72146	7210	B	SF	[PN]		RESIDENTIAL CARE FACILITY	Y	BERTHING FOR RETIRED NAVY PERSONNEL ON A LONG TERM BASIS.	
72147	7215	B	[SF]			WNDED WRS HSG	Y	A FACILITY DESIGNED TO PROVIDE TEMPORARY AND PERMANENT HOUSING FOR UNACCOMPANIED PERSONNEL IN A WOUNDED WARRIOR/WARRIOR IN TRANSITION STATUS.	
722						UNACOMP PERS HOUS-MESS FAC			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
Dining facilities for unaccompanied personnel and conference centers operated by Unaccompanied Housing that are located in, or adjacent to, Unaccompanied Housing facilities. For clubs and open mess facilities, see the appropriate codes in 740 series. For additional information see design criteria UFC 4-722-01, "Dining Facilities".									
72210	7220	B	SF	[PN]		GALLEY/MESS HALL	Y	THIS GROUP INCLUDES DINING FACILITIES FOR UNACCOMPANIED PERSONNEL.	
72235	7220	B	[SF]	PN		AUSTERE GALLEY	Y	AUSTERE GALLIES PROVIDE CORE DINING, FOOD PREPARATION, AND SUPPORT AREAS FOR LOCATIONS DETERMINED AUSTERE BY CNIC. THESE FACILITIES ARE INTENDED TO PROVIDE THE MINIMUM FOOTPRINT AREA AND FINISHES TO SUPPORT GALLEY FUNCTIONS WHILE PROVIDING MINIMAL UP FRONT AND TOTAL OWNERSHIP COSTS IN COMPARISON TO NON-AUSTERE LOCATIONS.	
72250	7233	B	[SF]	NS	SH	COLD STOR DET GALLEY/MESS	N	THIS CODE IS FOR INVENTORY PURPOSES ONLY IN CASES WHERE COLD STORAGE FACILITIES ARE DETACHED FROM THE GALLEY PROPER.	
72260	6100	B	[SF]			CONFERENCE CENTER	N	THIS CATEGORY CODE IS FOR INVENTORY PURPOSES ONLY, AND INCLUDES ONLY THOSE CONFERENCE ROOMS LOCATED IN UNACCOMPANIED HOUSING.	

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723 UNACOMP PERS  
HOUS-DET FACS

Facilities appurtenant to unaccompanied personnel housing such as latrines, unit administrative and storage facilities and other facilities which are normally included as an integral part or permanent unaccompanied personnel housing but are usually provided as separate appurtenances to semi-permanent and temporary personnel housing.

72320	7234	B	[SF]	PN		LATRINE, DETACHED	N	LATRINE FACILITIES ARE PLANNED AS PART OF THE UNACCOMPANIED HOUSING. CODES ARE LISTED FOR INVENTORY PURPOSES ONLY.	
72330	7342	B	[SF]			LAUNDRY, DETACHED	N	LATRINE AND LAUNDRY FACILITIES ARE PLANNED AS PART OF THE UNACCOMPANIED QUARTERS. CODES ARE LISTED FOR INVENTORY PURPOSES ONLY.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
72340	7232	B	SF	[VE]		GARAGE, DETACHED UH	N	INDIVIDUAL GARAGES WILL NOT BE PLANNED IN CONJUNCTION WITH TROOP HOUSING. THIS CATEGORY CODE SHOULD BE USED FOR INVENTORY PURPOSES ONLY.	
72350	7235	S		[EA]		WASH RACK, DETACHED	N	WASH RACKS FOR GALLEY GARBAGE CONTAINERS, AND WASH RACKS FOR UNACCOMPANIED RESIDENT'S VEHICLES ARE PLANNED AS PART OF GALLEYS AND UNACCOMPANIED HOUSING. THIS CATEGORY CODE SHOULD BE USED FOR INVENTORY PURPOSES ONLY.	
72360	7231	B	[SF]			TROOP HSG OTHER DET BLDG	N	THESE CODES ARE FOR INVENTORY PURPOSES ONLY AND ARE TO BE USED FOR MINOR DETACHED BUILDINGS DIRECTLY RELATING TO UNACCOMPANIED HOUSING FUNCTIONS.	
72361	7235	S		[EA]		TROOP HSG OTHER DET FAC	N	THESE CODES ARE FOR INVENTORY PURPOSES ONLY AND ARE TO BE USED FOR MINOR DETACHED FACILITIES DIRECTLY RELATING TO UNACCOMPANIED HOUSING FUNCTIONS.	
72377	4421	B	[SF]			TROOP HSG STRG(MISC)	Y	STORAGE FACILITIES FOR MISCELLANEOUS EQUIPMENT AN/OR GOODS RELATED TO UNACCOMPANIED HOUSING SUPPORT WILL BE PROVIDED ONLY WHERE IT CAN BE INDIVIDUALLY JUSTIFIED.	
724						UNACOMP PERS HOUS-OFF QTRS			
Public housing for unaccompanied officers and comparable civilians excluding club and club messing.									
72411	7240	B	SF	[PN]		UNACCOMPANIED OFF HSG	Y	UNACCOMPANIED OFFICER HOUSING, ALL RANKS	
72415	7214	B	[SF]	PN		UDP HOUSING M.E. (OFFICER)	Y	HOUSING FOR UNIT DEPLOYED PERSONNEL (UDP) HOUSING - MISSION ESSENTIAL - OFFICER	
725						UNACOMP PERS HOUS-EMERGENCY			



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
Hutments (quonset and similar) and tent frames and floors for troop or civilian emergency housing. Excludes detached facilities coded in the 723 series.									
72510	7250	B	[SF]	PN		TROOP HSG EMERGENCY BLDG	Y		THESE MAY BE HUTMENTS (QUONSETS), TENT FRAMES WITH FLOORS AND MAY BE PERMANENT, SEMI-PERMANENT, OR TEMPORARY TYPES OF BUILDINGS. CODES ARE LISTED FOR INVENTORY PURPOSES ONLY.
72511	7251	S	SF	[EA]		TROOP HSG EMERGENCY FAC	N		THESE MAY BE HUTMENTS (QUONSETS), TENT FRAMES WITH FLOORS AND MAY BE PERMANENT, SEMI-PERMANENT, OR TEMPORARY TYPES OF FACILITIES. NO CRITERIA FOR THESE FACILITIES ARE CURRENTLY AVAILABLE. CODES ARE LISTED FOR INVENTORY PURPOSES ONLY.
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730						COMMUNITY FAC- PERS SUPPORT			
Municipal type facilities for support of the personnel component. Excludes morale, welfare, and recreation facilities in the 740 and 750 series.									
73010	7311	B	[SF]			FIRE STATION	Y		THIS CRITERIA APPLIES TO FIRE STATIONS WITH STRUCTURAL AND BRUSH FIRE MISSIONS AND IS TO BE USED AS A GUIDELINE FOR PLANNING FIRE STATIONS WITH AIR CRASH RESCUE OPS AND COMBINED STRUCTURAL FIRE AND RESCUE OPS. FIRE STATIONS CONSIST OF AN ALARM COM CENTER, TRAINING FACILITIES, LIVING QUARTERS, RECREATION/DINING FACILITIES, ADMIN OFFICES, AN EQUIPMENT MAINTENANCE AREA, AND AN APPARATUS ROOM.
73011	7311	B	SF	[EA]		FIRE HOSE DRYING STRUCTURE	N		CATEGORY CODE 730 11 AND 12 ARE FOR INVENTORY PURPOSES ONLY IN CASES WHERE THESE FACILITIES ARE PROVIDED IN A SEPARATE BUILDING OR STRUCTURE. FOR PLANNING PURPOSES, THEY ARE TO BE CONSIDERED AS PART OF THE FIRE STATION, CODE 730 10.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
73012	7311	B	[SF]			FIRE CART/HOSE DRYING FAC	N	CATEGORY CODE 730 11 AND 12 ARE FOR INVENTORY PURPOSES ONLY IN CASES WHERE THESE FACILITIES ARE PROVIDED IN A SEPARATE BUILDING OR STRUCTURE. FOR PLANNING PURPOSES, THEY ARE TO BE CONSIDERED AS PART OF THE FIRE STATION, CODE 730 10.	
73013	7343	B	[SF]			ISSU/RETAIL CLOTHING/UNIFM	N	THIS IS A RETAIL OUTLET FOR MILITARY CLOTHING AND ACCESSORIES. THIS FACILITY IS OPERATED BY THE NAVY AND MARINE CORPS EXCHANGE SERVICE.	
73015	7312	B	[SF]	PN		BRIG	Y	THIS CODE IS TO BE USED FOR FACILITIES WHOSE PRIMARY PURPOSE IS THE CONFINEMENT OF PERSONNEL.	
73020	7313	B	[SF]			SEC BUILDING	Y	A SECURITY BUILDING WHICH HOUSES THE SHORE PATROL AND MILITARY OR CIVILIAN POLICE FORCES MAY VARY IN USE FROM A STANDARD POLICE STATION TO A LARGE SECURITY DEPARTMENT PROVIDING COUNTER-TERRORISM FUNCTIONS AND INVESTIGATIVE SERVICES.	
73021	1498	B	[SF]			DEFENSIVE FIGHTING POS	Y	AN ELEVATED DEFENSIVE FIGHTING POSITION LOCATED AT ECP'S AND OTHER AREAS NEEDING ADDITIONAL ENTRY SECURITY.	
73025	1498	B	[SF]			GATE / SENTRY HOUSE	Y	THE GATE/SENTRY HOUSE MAY VARY IN SIZE FROM A SIMPLE SENTRY SHELTER TO A BUILDING HOUSING A GATE GUARD OFFICE, CLERICAL OFFICE, AND WAITING ROOM; OR A TRUCK INSPECTION BUILDING.	
73030	7321	B	[SF]			BAKERY	Y	THE ESTABLISHMENT OF BAKERIES IS GOVERNED BY PROVISIONS OF DOD INSTRUCTION 4100.33 ? COMMERCIAL OR INDUSTRIAL ACTIVITIES ? OPERATION OF. NORMALLY A BAKERY WILL BE AUTHORIZED WHERE COMMERCIAL SOURCES ARE NOT AVAILABLE.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG IND.	DESCRIPTION
			AREA	OTHER	ALT			
73035	7382	B	[SF]	PN		LOCKER ROOM	Y	THIS FACILITY PROVIDES LOCKER SPACE FOR THE BELONGINGS OF MILITARY PERSONNEL WHO MUST VACATE THEIR QUARTERS FOR EXTENDED PERIODS OF TIME, FOR THOSE WHOSE ALLOTTED STORAGE SPACE IS NOT SUFFICIENT, AND FOR OTHER USES AS DEEMED JUSTIFIED BY THE COMMANDING OFFICER.
73036	7332	B	[SF]			LUNCH/LOCKER ROOM	Y	THIS FACILITY IS GENERALLY PROVIDED ONLY TO SUPPORT INDUSTRIAL OPERATIONS WHERE OTHER MESSING FACILITIES ARE NOT AVAILABLE AND REQUIRES SPECIFIC JUSTIFICATION.
73040	7342	B	[SF]			LAUNDRY/DRY CLEANING PLT	Y	LAUNDRY AND DRY CLEANING PLANTS. THE ESTABLISHMENT OF THESE FACILITIES IS GOVERNED BY PROVISIONS OF DOD INSTRUCTION 4100.33 - COMMERCIAL OR INDUSTRIAL ACTIVITIES - OPERATION OF. NORMALLY THEY WILL BE AUTHORIZED ONLY IN LOCATIONS WHERE COMMERCIAL FACILITIES ARE NOT AVAILABLE.
73061	7352	B	[SF]		PN	DEP SCHOOL - CONSOLIDATED	Y	DEPENDENT SCHOOL GRADES K-12. THE PLANNING AND PROGRAMMING FOR DEPENDENT SCHOOL FACILITIES OVERSEAS IS CURRENTLY UNDER THE COGNIZANCE OF DEPARTMENT OF DEFENSE EDUCATION ACTIVITY (DODEA). DEPENDENT SCHOOLS PROVIDE EDUCATION FOR DEPENDENTS OF MILITARY PERSONNEL.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
73065	7383	B	[SF]	PN		FALLOUT SHELTER	N	THERE ARE TWO KINDS OF FALLOUT SHELTERS: DUAL-PURPOSE AND SINGLE-PURPOSE. A DUAL-PURPOSE FALLOUT SHELTER HAS A PRIMARY PURPOSE AND SATISFIES SOME OTHER BASIC REQUIREMENT SUCH AS HOUSING, ADMINISTRATIVE, STORAGE, ETC., BUT IS DESIGNATED TO PROVIDE FALLOUT PROTECTION IN EMERGENCIES. A SINGLE-PURPOSE FALLOUT SHELTER IS A BUILDING OR PART OF A BUILDING WHOSE SINGULAR PURPOSE IS FALLOUT PROTECTION.	
73066	7384	S	[SF]			MISC PERS WEATHER SHELTERS	Y	SHELTERS MAY BE ESTABLISHED AT BUS STOPS OR OTHER LOCATIONS AS REQUIRED. PROVIDE 0.5 SQ.M. (5 SF) PER PERSON.	
73067	7341	B	[SF]			BUS STATION	Y	A BUS STATION IS A TERMINAL WITH SPACE FOR A WAITING ROOM AND BUS TICKET SALES. IT MAY BE PLANNED AS REQUIRED.	
73074	7449	B	[SF]			KENNEL - MWR OPERATED	N	A TEMPORARY BOARDING FACILITY FOR DOGS AND CATS OPERATED BY MWR.	
73075	7385	B	[SF]	PN		PUBLIC TOILET	N	USE THIS CODE FOR INVENTORY OF ALL DETACHED COMFORT STATIONS, SUCH AS THOSE AT BALL FIELDS AND PICNIC AREAS, EXCEPT FOR THOSE IN THE UNACCOMPANIED HOUSING AREA. USE CATEGORY CODE 723 20 LATRINE FOR THE UNACCOMPANIED HOUSING AREA.	
73076	1445	B	[SF]			KENNEL	Y	USE THIS CATEGORY CODE FOR MILITARY WORKING DOG (MWD) KENNELS AND QUARANTINE FACILITIES OPERATED BY THE SECURITY DEPARTMENT.	
73077	4421	B	[SF]			PERSONNEL SUPPT STRG(MISC)	Y	STORAGE FACILITIES FOR MISCELLANEOUS GOODS RELATED TO PERSONNEL SUPPORT FACILITIES.	
73078	7322	B	[SF]			DAIRY PLANT	Y	A FACILITY FOR THE RECEIVING AND PROCESSING OF MILK AND MILK PRODUCTS.	
73082	8331	S	[SF]		EA	RECYCLING CTR	Y	THIS FACILITY SERVES AS A COLLECTION, SORTING, STORAGE, AND SHIPPING CENTER FOR RECYCLABLE MATERIALS AND PRODUCTS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
73083	7361	B	[SF]		SE	RELIGIOUS MINISTRY FAC	Y	RELIGIOUS MINISTRY FACILITY (RMF) IS A GENERIC TERM FOR FACILITY ASSETS USED TO SUPPORT COMMAND RELIGIOUS PROGRAMS. RMFS MUST THEREFORE ACCOMMODATE THE RELIGIOUS RIGHTS AND NEEDS OF A MULTI-FAITH, INTER-GENERATIONAL, CULTURALLY DIVERSE MILITARY POPULATION.	
73085	7344	B	[SF]			POST OFFICE	Y	FACILITY FOR HANDLING AND DISTRIBUTING US MAIL TO AN INSTALLATION, EITHER AS A STANDALONE FACILITY OR PART OF ANOTHER FACILITY UNDER A DIFFERENT CATEGORY CODE.	
731									
732									
733									
734									
735						EDUCATION FAC MISC			
736									
737									
738									
740						COMM FAC- MOR,WEL&REC INTR			
Indoor, athletic, recreation, and exchange facilities.									
74001	7346	B	[SF]			EXCHANGE RETAIL STORE	Y	THE EXCHANGE RETAIL STORE IS PLANNED AS PART OF AN AUTHORIZED NAVY OR MARINE CORPS EXCHANGE. THE STORE INCLUDES SALES AREA, IMMEDIATE BACK-UP STOCK AREA, STORE OFFICE, TOILETS AND CIRCULATION SPACE.	
74003	7387	B	[SF]			EXCHGE CENTRL ADMIN	Y	THIS IS SPACE REQUIRED FOR THE GENERAL ADMINISTRATIVE EFFORT OF AN EXCHANGE SUCH AS ACCOUNTING, PAYROLL, PERSONNEL, PURCHASING OR WAREHOUSING.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
74004	7331	B	[SF]			EXCHANGE / MWR FOOD SVC	Y	THESE FACILITIES INCLUDE: CAFETERIAS, SPECIALTY SHOPS SIMILAR TO DELI, FAST FOOD AND PIZZA, BAKE SHOPS, ICE CREAM SHOPS, ETC. FOOD SERVING FACILITIES OPERATED IN AND FOR THE SOLE CONVENIENCE OF NON-EXCHANGE ACTIVITIES SUCH AS BOWLING ALLEYS, THEATERS, AIR TERMINALS AND SIMILAR, IS ALREADY INCLUDED IN THE BASIC SPACE ALLOWANCE FOR SUCH ACTIVITIES.	
74009	7346	B	[SF]			EXCHANGE SERVICE OUTLETS	Y	EXCHANGES ARE NAVY EXCHANGE SERVICEC COMMAND (NEXCOM) AUTHORIZED OUTLETS FOR BASIC SERVICES IN CONJUNCTION WITH THE RETAIL STORE, SUCH AS BARBER SHOP, TAILOR/UNIFORM SHOP, RADIO/TV REPAIR SHOP, PORTRAIT STUDIO, WATCH REPAIR SHOP, OPTICAL SHOP, BEAUTY SALON, AND PERSONAL SERVICES.	
74011	7346	B	[SF]			NEX DEPOT (SERVMART)	Y	NEX DEPOTS ARE SIMILAR TO TRADITIONAL NAVY SERVMARTS, AND OFFER THE SAME TYPE OF INVENTORY, IN A MORE CONVENIENT SETTING. AN NEX DEPOT MAY BE PROVIDED AS DICTATED BY NEXCOM.	
74012	6100	B	[SF]			RED CROSS/NAVY RELIEF	Y	SPACE PROVIDED WITHIN OTHER FACILITIES FOR THE RED CROSS AND NAVY RELIEF ORGANIZATIONS.	
74013	7342	B	[SF]			EXCHANGE LAUNDRY DRY CL	Y	DRY CLEANING PLANT AND COIN LAUNDRY FACILITY OPERATED BY THE NAVY EXCHANGE SERVICE COMMAND (NEXCOM).	
74016	7387	B	[SF]			EXCHANGE MAINTENANCE SHOP	Y	AN EXCHANGE MAINTENANCE SHOP MAY BE PROVIDED FOR THE LOCAL REPAIR OF EXCHANGE EQUIPMENT, FIXTURES REPAIR OF REFRIGERATION EQUIPMENT AND VENDING MACHINES, AND TO PROVIDE SHOP SPACE FOR FACILITY MAINTENANCE CREWS AND PERSONNEL.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
74018	7347	B	[SF]			BANK	Y	BANKS MAY BE ESTABLISHED ONLY WHEN THEY ARE AUTHORIZED BY THE U.S. TREASURY DEPARTMENT. NORMALLY THERE WILL BE ONLY ONE BANKING FACILITY AT EACH INSTALLATION.
74019	7347	B	[SF]			CREDIT UNION	Y	CREDIT UNIONS ARE PRIVATE COOPERATIVE SAVINGS AND LOAN ORGANIZATIONS. FACILITIES FOR A PROPERLY CHARTERED CREDIT UNION MAY BE PROVIDED TO SERVE MILITARY PERSONNEL, THEIR DEPENDENTS, AND OTHER PERSONNEL AS PERMITTED IN THE BYLAWS OF THE CREDIT UNION.
74020	7441	B	[SF]			PCS OFFICIAL LODGING	N	THESE FACILITIES ARE LODGING PROVIDED AT A COST TO PERSONNEL WHO ARE WITHOUT HOUSING DUE TO EXECUTING PERMANENT CHANGE OF STATION (PCS) ORDERS. THESE FACILITIES MAY BE USED BY TEMPORARY DUTY OR LEISURE TRAVELERS. WHERE NEW CONSTRUCTION IS AUTHORIZED, CONSTRUCT MOTEL TYPE FACILITIES WITH BATH AND WITH KITCHENETTES. LIVING UNITS SHALL CONTAIN NO MORE THAN 450 SQUARE FEET OF LIVING AREA. APPROPRIATE CIRCULATION, ADMINISTRATION, MECHANICAL AND SERVICE SPACE WILL BE PROVIDED.
74021	7440	B	[SF]			VISITOR RECEPTN (RECRUIT)	Y	A VISITOR'S RECEPTION CENTER IS LIMITED TO INSTALLATIONS PERFORMING BASIC TRAINING. IT SERVES AS A POINT OF CONTACT BETWEEN TRAINEES AND VISITING RELATIVES OR FRIENDS.
74023	7349	B	[SF]			COMMISSRY INC BACKUP STRG	Y	FACILITY USED FOR THE SALE OF PERISHABLE GOODS AND OTHER GROCERIES AND FOODSTUFFS. OPERATED BY THE DEFENSE COMMISSARY AGENCY (DECA).
74024	4321	B	[SF]		CF	COMMISSARY COLD STRG,DET	Y	DETACHED FACILITY USED FOR COLD STORAGE OF PERISHABLE ITEMS STOCKED FOR THE COMMISSARY.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
74025	7372	B	[SF]			FAMILY SERVICES CNTR	Y	THE FAMILY SERVICES CENTER (FSC) FACILITY SUPPORTS THE PROGRAMS THAT PROVIDE THE INFORMATION AND FAMILY SERVICES NECESSARY TO SUPPORT QUALIFIED SINGLE AND MARRIED DEPARTMENT OF DEFENSE (DOD) PERSONNEL AND THEIR FAMILY MEMBERS IN MEETING THE UNIQUE DEMANDS OF THE MILITARY LIFESTYLE, AS DEFINED BY DOD INSTRUCTION 1342.22, FAMILY CENTERS.	
74027	1441	B	[SF]			ARMED FORCES RADIO/TV STA	Y	A RADIO AND/OR TV STATION IS NORMALLY ESTABLISHED IN OVERSEAS LOCATIONS TO PROVIDE U.S. INSTALLATION POPULATION WITH ENTERTAINMENT AND NEWS COVERAGE. AS A RULE, THE COVERAGE RADIUS IS LIMITED TO THE INSTALLATION AND IMMEDIATE VICINITY AND THE FACILITIES ARE RESTRICTED FOR TRANSMISSION OF PRERECORDED PROGRAM MATERIAL.	
74028	7417	B	[SF]			AMUSEMENT CTR / REC MALL	Y	AMUSEMENT CENTERS ARE RECREATIONAL FACILITIES WHICH CATER LARGELY TO THE LEISURE NEEDS OF YOUNGER ACTIVE-DUTY PERSONNEL AND YOUTH FROM MILITARY FAMILIES.	
74030	7345	B	[SF]	OL		EXCHGE AUTO REPAIR STA	Y	THIS FACILITY PROVIDES SPACE FOR GASOLINE AND OIL SALES, AUTOMOTIVE PARTS AND ACCESSORIES SALES, EMERGENCY SERVICE AND AUTOMOTIVE REPAIR SERVICE.	
74032	7348	B	[SF]			EXCHANGE CAR WASH	Y	AN EXCHANGE OPERATED CAR WASH MAY BE PROVIDED AS DICTATED BY THE NAVY EXCHANGE SERVICE COMMAND. THE NAVY EXCHANGE NORMALLY OPERATES AUTOMATED, DRIVE-THRU CAR WASHES. FOR MWR (SELF SERVICE) CAR WASHES SEE CCN 740-91.	
74034	7340	B	[SF]			THRIFT SHOP	Y	THIS IS A NONPROFIT FACILITY FOR THE SALE AND PURCHASE BY MILITARY PERSONNEL OF USED APPAREL, FURNISHINGS AND EQUIPMENT.	



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
74036	7411	B	[SF]			HOBBY SHOP - CRAFTECH	N	THIS FACILITY IS USED FOR THE PURSUIT OF WOODWORKING, PICTURE FRAMING, CERAMICS AND OTHER HOBBY PASTIMES. THIS CCN IS FOR INVENTORY PURPOSES ONLY.	
74037	7446	B	[SF]			MWR OUTDOOR REC CTR	Y	THIS CATEGORY CODE APPLIES TO THREE TYPES OF FACILITIES: OUTDOOR ADVENTURE CENTERS (OAC), RENTAL CENTERS (RC), AND OUTDOOR CENTERS & OTHER RENTALS (OCOR). GENERALLY, OAC, RC, AND OCORS ARE FACILITIES THAT RENT AND/OR SELL GOODS THAT ARE ASSOCIATED WITH OUTDOOR ACTIVITIES AND OUTDOOR RECREATION PROGRAMS (ORP).	
74038	7412	B	[SF]			MWR AUTO SKILLS CTR	Y	THE MISSION OF AUTOMOTIVE SKILLS CENTER IS TO PROVIDE THEIR CUSTOMERS WITH A QUALITY, VALUE-BASED PROGRAM FOR THE MAINTENANCE, REPAIR, MODIFICATION AND IMPROVEMENT OF THEIR OWN VEHICLES INCLUDING CARS, TRUCKS, TRAILERS, MOTORCYCLES, AND BICYCLES.	
74040	7415	B	[SF]	LA		BOWLING CENTER	Y	BOWLING CENTERS ARE RECREATIONAL FACILITIES WHICH ACCOMMODATE BOWLING AND RELATED FUNCTIONS, WHICH MAY INCLUDE: OPEN BOWLING, LEAGUES, TOURNAMENTS, YOUTH BOWLING, INSTRUCTION, EXHIBITIONS, AND SUPPORT ACTIVITIES SUCH AS EQUIPMENT SALES AND RENTAL, FOOD AND BEVERAGE SERVICE, ELECTRONIC AND TABLE GAMES, AND MEETINGS.	
74042	7417	B	[SF]			COMMUNITY REC CTR	Y	FORMERLY "FLEET REC CENTER". THESE ARE A CONSOLIDATION OF MULTIPLE CATEGORY B MWR ACTIVITIES INTO ONE FACILITY WHICH ALLOWS FOR REDUCED FOOTPRINT, OVERHEAD, AND STAFFING COSTS WHILE PROVIDING MORE CONVENIENT ACCESS TO A VARIETY OF RECREATIONAL PROGRAMS, SERVICES, AND FACILITIES FOR THE INSTALLATION COMMUNITY.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
74044	7421	B	[SF]			INDOOR PHYSICAL FIT CTR	Y	PHYSICAL FITNESS FACILITIES PROVIDE FACILITIES AND SUPPORT SERVICES TO MEET THE INDIVIDUAL PHYSICAL FITNESS, COORDINATION, SKILLS DEVELOPMENT, RECREATION AND TRAINING NEEDS OF MILITARY PERSONNEL.	
74045	7421	B	[SF]			FITNESS ROOM	N	FITNESS ROOMS ARE STAND ALONE GYMNASIUM FACILITIES, USUALLY CARDIO EQUIPMENT AND WEIGHT MACHINES OR FREE WEIGHTS, IN A SINGLE AREA OF ROOMS WITHIN A FACILITY OF A DIFFERENT CCN. THIS CCN IS PRIMARILY FOR INVENTORY PURPOSES,	
74046	7418	B	[SF]			ROLLER / ICE SKATING RINK	Y	THIS FACILITY SERVES AS A ROLLER/ICE SKATING RINK REQUIRING A HARD SURFACE FLOOR WITH POTENTIAL FOR MULTIPURPOSE USE.	
74047	7446	B	[SF]			INFO, TKT TRAVEL OFFICE	Y	THE MISSION OF THE RECREATION INFORMATION, TICKETS AND TRAVEL (ITT) OFFICE IS TO SERVE THE MILITARY COMMUNITY'S LEISURE NEEDS BY PROVIDING INFORMATION ON WHAT TO SEE AND DO LOCALLY, OFFERING TOURS TO NEARBY ATTRACTIONS, SELLING TICKETS FOR MUSICAL AND THEATRICAL PERFORMANCES, AND OTHER SPECIAL EVENTS, AND PROVIDING OPTIONS FOR LEISURE TRAVEL (THIS MAY INCLUDE CRUISE AND AIRLINE TICKET SERVICE).	
74049	7421	B	[SF]			AUSTERE FITNESS CENTER	Y	AUSTERE PHYSICAL FITNESS FACILITIES PROVIDE FACILITIES AND SUPPORT SERVICES TO MEET THE INDIVIDUAL PHYSICAL FITNESS, COORDINATION, SKILLS DEVELOPMENT, RECREATIONAL AND TRAINING NEEDS OF MILITARY PERSONNEL STATIONED IN DESIGNATED AUSTERE OPERATING ENVIRONMENTS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.	
74052	7448	B	[SF]			GUN/SKEET/TRAP BLDG	Y	THIS FACILITY IS FOR SUPPORT OF THE RESPECTIVE RANGES AND CONTAINS OPERATOR'S OFFICE, STORAGE, SALES AREA, GUN MAINTENANCE SHOP, TOILETS AND LOUNGE.
74053	7422	B	[SF]		ME	SWIMMING POOL - INDOOR	Y	THE PRIMARY PURPOSE OF SWIMMING POOLS IS TO SUPPORT PHYSICAL READINESS PROGRAMS AS WELL AS INSTRUCTIONAL, INFORMAL AND INTRAMURAL ACTIVITIES, AND TO SERVE THE RECREATIONAL NEEDS OF ACTIVE-DUTY MILITARY PERSONNEL AND THEIR SPOUSES AND CHILDREN, RETIREES AND DOD AUTHORIZED CIVILIANS.
74054	7417	B	[SF]			MWR MIL REC CENTER	Y	THE MWR MILITARY RECREATION CENTER (MRC) HAS INCORPORATED THE FEATURES AND FUNCTIONS OF THE FLEET RECREATION CENTER IN ORDER TO DEFINE A FACILITY THAT SERVES THE RECREATIONAL NEEDS OF BOTH SHIP-BASED ENLISTED PERSONNEL AS WELL AS THOSE LIVING IN BACHELOR ENLISTED QUARTERS. THEY CONSIST OF SERVICES, FACILITIES, AND PROGRAMS INTENDED TO PROVIDE ALCOHOL-FREE AND TOBACCO-FREE RECREATIONAL ALTERNATIVES FOR 17- TO 25-YEAR OLDS. ALSO KNOWN AS LIBERTY OR SINGLE SAILOR CENTERS.
74055	7417	B	[SF]			YOUTH & SAC (6- 18 YRS)	Y	THE YOUTH CENTER IS A SOCIAL AND RECREATIONAL CENTER PRIMARILY FOR USE BY CHILDREN AGES 6 TO 18 IN SUPPORT OF A YOUTH PROGRAM. THE YOUTH CENTER SUPPORTS OPPORTUNITIES FOR YOUTH TO DEVELOP THEIR PHYSICAL, SOCIAL, EMOTIONAL, AND COGNITIVE ABILITIES AND TO EXPERIENCE ACHIEVEMENT, LEADERSHIP, ENJOYMENT, FRIENDSHIP, AND RECOGNITION.
74056	7431	B	[SF]		SE	THEATER	Y	THIS CATCODE IS FOR A FACILITY FOR THE SHOWING OF MOVIES AND THE PRESENTATION OF STAGE PRODUCTIONS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
74067	7333	B	[SF]			ALL HANDS CLUB	Y	THIS CODE IS USED TO PLAN THE SPACE REQUIREMENTS FOR A SINGLE FACILITY TO ACCOMMODATE ON-BASE FACILITIES, SURROUNDING COMPETITIVE ENVIRONMENT AND SIZE OF THE SUPPORTING POPULATION. IT MAY INCLUDE ONE OR MORE OF THE FOLLOWING COMPONENTS: TABLE SERVICE RESTAURANT, QUICK SERVICE RESTAURANT, BANQUET/CATERING ROOM, CAFETERIA, GAMING ROOM (OCONUS, NON-US), BEVERAGE LOUNGE WITH OR WITHOUT ENTERTAINMENT.	
74068	7333	B	[SF]			MWR CATERING FACILITY	Y	THIS FACILITY MAY BE STAND ALONE OR COMBINED WITH AN OFFICERS CLUB, ENLISTED CLUB, ALL HANDS CLUB, BOWLING CENTER, MARINA CLUBHOUSE, OR GOLF CLUBHOUSE. THE CATERING FACILITY OFTEN INCLUDES BINGO OPERATIONS IN AT LEAST ONE ROOM.	
74071	7346	B	[SF]			NEX PACKAGE STORE	Y	THIS FACILITY PROVIDES FOR RETAIL SALES TO AUTHORIZED CUSTOMERS AND THE TRANSFER (WHOLESALE) OF ALCOHOLIC BEVERAGES TO CLUBS AND OPEN MESSES. A SELECT FEW LOCATIONS HAVE PACKAGE STORES OPERATED BY MWR AS PERMITTED BY CONGRESS.	
74074	7371	B	[SF]			CHILD DEVELOPMT CENTER	Y	CHILD DEVELOPMENT CENTERS PROVIDE CHILD CARE/DEVELOPMENT FOR CHILDREN AGES 6-WEEKS TO 6 YEARS OLD FOR FULL-DAY, PART-DAY, AND HOURLY CARE.	
74075	7414	B	[SF]			NAVY FLYING CLUB FACILITY	Y	THE NAVY FLYING CLUB IS A RECREATIONAL FLYING ACTIVITY LOCATED ON OR NEAR MILITARY INSTALLATIONS USED BY AUTHORIZED PERSONNEL AND APPROVED BY THE DEPARTMENT CONCERNED.	
74076	7416	B	[SF]			LIBRARY	Y	THIS FACILITY IS FOR RECREATIONAL READING AND STUDY.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
74077	4421	B	[SF]			MWR READY STOR	Y	STORAGE FACILITIES FOR MISCELLANEOUS EQUIPMENT AND/OR GOODS RELATED TO COMMUNITY SUPPORT WILL BE PROVIDED ONLY WHERE THEY CAN BE INDIVIDUALLY JUSTIFIED. THERE ARE NO CRITERIA FOR THIS TYPE OF FACILITY.	
74078	7531	S	[SF]			RECREATION PAVILION	Y	THE PURPOSE OF THIS FACILITY IS TO SUPPORT RECREATION AREAS SUCH AS PARKS, PLAYGROUNDS, PICNIC AREAS, BEACHES, ETC. THIS FACILITY MAY INCLUDE LOUNGE, TOILETS, BATHHOUSES, STORAGE AREAS, SNACK BARS, AND/OR CONCESSION STAND FOR LIMITED AND RELATED ITEMS AS REQUIRED.	
74079	7444	B	[SF]			RIDING STABLES	Y	PROVIDES SPACE FOR SINGLE STALLS, BOX OR DOUBLE STALLS, TREATMENT STALLS, QUARANTINE AREAS, QUARTERS FOR ONE OPERATOR, HAY STORAGE AREA, GRAIN ROOM, TACK LOCKERS, SWEAT PAD AND BLANKET DRYING AREA, OFFICE, AND TOILETS.	
74080	7413	B	[SF]			GOLF CLUBHOUSE	Y	THIS FACILITY ACTS AS THE MAIN SERVICE AREA FOR THE GOLF COURSE. FOODSERVICE AND GOLF EQUIPMENT SALES ARE THE TWO PRIMARY FUNCTIONS OF THE CLUBHOUSE.	
74081	7442	B	[SF]	EA		MWR RENTAL ACCOMMODATIONS	Y	MWR RENTAL ACCOMMODATIONS ARE PERMANENT, STAND-ALONE, OR MULTIPLEX BUILDINGS. THEY MAY TAKE THE FORM OF MODERN MOTELS, MULTI-LEVEL HOTELS, PRIMITIVE CAMPING CABINS WITH NO UTILITY CONNECTIONS, OR ALMOST ANYTHING IN BETWEEN, DEPENDING ON THE GEOGRAPHY, THE MARKET BEING SERVED, AND DEMAND.	
74082	7448	B	[SF]			GOLF STOR MAINT FAC	Y	A GOLF STORAGE/MAINTENANCE FACILITY PROVIDES SPACE FOR MAINTENANCE, STORAGE, AND SUPPORTING SPACES ASSOCIATED WITH INSTALLATION GOLF COURSES OF NINE OR MORE HOLES.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
74085	7388	B	[SF]			EXCHGE DIST CTR (WRHSE)	Y	THIS TYPE WAREHOUSE MAY BE PROVIDED FOR BULK BACK-UP STORAGE (EXCHANGE STOCK AND OPERATING SUPPLIES) TO SUPPORT ALL EXCHANGE OPERATIONS WITHIN A GEOGRAPHICAL AREA AS DETERMINED BY NEXCOM OR MARINE CORPS EXCHANGE SERVICES.	
74086	7388	B	[SF]			EXCHANGE INSTALLATION WHSE	Y	THIS CATCODE IS FOR THE TOTAL STORAGE SPACE THAT MAY BE PROVIDED IN INSTALLATION EXCHANGE WAREHOUSES TO ACCOMMODATE BACK-UP STORAGE FOR EXCHANGE RETAIL ACTIVITIES FOR THAT INSTALLATION.	
74087	7445	B	[SF]			MARINA SUPPT BLDG	Y	THIS FACILITY PROVIDES SPACE FOR OFFICE, EQUIPMENT CHECK-OUT, REPAIR, AND STORAGE. IT DOES NOT INCLUDE DOCKS, MARINA SLIPS, AND WALKWAYS WHICH ARE LISTED UNDER CODE 750 60. THIS IS A SPECIAL FACILITY WHICH IS REQUIRED ONLY AT OUTDOOR RECREATION AREAS WHICH HAVE WATERFRONT FACILITIES AVAILABLE FOR BOATING ACTIVITIES.	
74088	7351	B	[SF]			EDUCATIONAL SRVCS OFFICE	Y	THIS FACILITY IS INTENDED TO PROVIDE FACILITIES FOR THE ADVANCEMENT OF THE ACADEMIC, TECHNICAL, AND VOCATIONAL EDUCATION OF MILITARY PERSONNEL OF ALL GRADES AND RANKS IN ORDER TO ENHANCE THEIR POTENTIAL TO THE SERVICE.	
74089	7385	B	[SF]			BATHHOUSE	Y	THE PRIMARY PURPOSE OF A BATHHOUSE IS TO PROVIDE A FACILITY FOR POOL AND BEACH USERS TO STORE THEIR BELONGINGS WHILE USING THE RECREATIONAL FACILITY, TO CLEAN UP, AND HAVE A PLACE TO USE THE RESTROOM. IN ADDITION, THE BATHHOUSE CONTAINS THE OFFICES FOR THE ADMINISTRATIVE STAFF AND LIFEGUARDS.	
74090	7448	B	[SF]			MWR EQUIP MAINT SHOP	Y	AN MWR EQUIPMENT MAINTENANCE SHOP IS WHERE NAF VEHICLES AND GROUNDS MAINTENANCE EQUIPMENT (NON-GOLF), IS MAINTAINED.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
74091	7348	B	[SF]			MWR CAR WASH	Y	A COIN OPERATED STAND ALONE CAR WASH AND VACUUM ISLAND OPERATED BY MWR.	
74092	7443	B	[SF]			MWR RV SUPPORT BLDG	Y	RECREATIONAL RV PARKS PROVIDE THE MILITARY COMMUNITY WITH OUTDOOR RECREATION OPPORTUNITIES AT LOCATIONS WITH ATTRACTIVE NATURAL RESOURCES. TO COMPLEMENT THE CAMPING EXPERIENCE, AND DEPENDING ON LOCATION, RECREATIONAL RV PARKS MAY OFFER ACTIVITIES SUCH AS BOATING, CANOEING, FISHING, HIKING, HUNTING, SKIING AND SWIMMING.	
74093	7384	S	SF	[EA]		SMOKING GAZEBO	N	SMOKING GAZEBOs ARE PROVIDED AS DESIGNATED SMOKING AREAS OUTSIDE OF NAVY AND MARINE CORPS FACILITIES. SIZE IS STANDARD. THIS CCN IS FOR INVENTORY PURPOSES.	
74094	7441	B	[SF]	PN		TDY OFFICIAL LODGING	Y	THESE FACILITIES PROVIDE TEMPORARY LIVING ACCOMMODATIONS THAT INCLUDES IN-ROOM HOUSEKEEPING SERVICES AND AMENITIES SIMILAR TO A MID-GRADE HOTEL. SERVICE CHARGES ARE ASSESSED TO TDY TRAVELERS TO MANAGE OPERATIONAL AND RECAPITALIZATION REQUIREMENTS. TDY OFFICIAL LODGING MAY BE USED BY PERMANENT CHANGE OF STATION AND LEISURE TRAVELERS	
74095	7441	B	[SF]	PN		LIM SVC OFFICIAL LODGING	Y	LIMITED SERVICE LODGING PROVIDES TRANSIENT FACILITIES FOR ACTIVE DUTY AND RESERVE MEMBERS (REGARDLESS OF RANK) OF DEPLOYED UNITS AT AN INSTALLATION OTHER THAN THE UNITS' HOMEPORT. THESE FACILITIES PROVIDE LIMITED IN-ROOM HOUSEKEEPING SERVICES AND AMENITIES COMMENSURATE WITH THE UNIT'S LENGTH OF STAY.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
74097	7441	B	[SF]			FISHER HOUSE	N	DON FISHER HOUSES PROVIDE TEMPORARY, CONVENIENT, AND AFFORDABLE LODGING TO NAVY MEDICAL TREATMENT FACILITY (MTF) PATIENTS (¿WOUNDED WARRIORS¿), MEMBERS OF THE FAMILIES OF SUCH PATIENTS, AND OTHERS PROVIDING THE EQUIVALENT OF FAMILIAL SUPPORT FOR SUCH PATIENTS.	
74098	6100	B	[SF]	PN		NGIS-OPERATED CONF CTR	N	CONFERENCE CENTERS OPERATED BY NAVY GATEWAY INNS AND SUITES	
741									
742									
743									
744									
750						COMMUNITY FAC- MW&R-EXTER		Outdoor, athletic, recreation, and exchange facilities.	
75010	7521	S	[EA]			OUTDOOR PLAYING COURTS	Y	OUTDOOR PLAYING COURTS PROVIDE FACILITIES AND SUPPORT SERVICES TO MEET THE INDIVIDUAL PHYSICAL FITNESS AND RECREATION NEEDS OF MILITARY PERSONNEL. THE FACILITIES MAY ALSO SERVE DEPENDENTS, RETIREES AND AUTHORIZED CIVILIANS.	
75020	7522	S	[EA]			PLAYING FIELDS	Y	PLAYING FIELDS PROVIDE FACILITIES AND SUPPORT SERVICES TO MEET THE INDIVIDUAL PHYSICAL FITNESS, COORDINATION, SKILLS DEVELOPMENT, TRAINING AND RECREATION NEEDS OF MILITARY PERSONNEL. THE FACILITIES MAY ALSO SERVE DEPENDENTS, RETIREES AND AUTHORIZED CIVILIANS. ACTIVITIES WHICH MAY BE ACCOMMODATED IN PLAYING FIELDS INCLUDE: BASEBALL, FOOTBALL, SOCCER, SOFTBALL, TRACK AND FIELD, ETC.	
75021	7521	S	SF	[EA]		BATTING CAGE	N	A SMALL ENCLOSED AREA WITH A PITCHING MACHINE OR OTHER PROVISION FOR PITCHING TO A BATTER TO ALLOW BATTING PRACTICE.	



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
75022	7523	S	[MI]	EA		JOGGING TRACK	N	JOGGING TRACKS MAY BE PAVED OR A NATURAL SURFACE AND ARE PROVIDED FOR THE INDIVIDUAL PHYSICAL FITNESS AND RECREATION OF MILITARY PERSONNEL. JOGGING TRACKS ARE PROVIDED AND SIZED AS REQUIRED.	
75023	7542	S	[MI]	EA		GO-CART TRACK	N	SMALL OVAL OR OTHER SHAPED PAVED TRACKS WHERE PARTICIPANTS RACE GASOLINE POWERED GO-CARTS.	
75030	7512	S	SF	EA	[ME]	OUTDOOR SWIM POOL	Y	OUTDOOR POOLS MAY INCLUDE WATER PARK FEATURES AND SPRAY PARKS.	
75033	7542	S	[EA]			DETACHED POOL FACILITY	N	THIS CATCODE IS USED IN THOSE CASES WHERE SUCH FACILITIES ARE LOCATED IN A BUILDING SEPARATE FROM THE MAIN POOL HOUSE.	
75034	7512	S	[EA]			WADING POOL / SPLASH PL	N	WADING POOLS ARE SMALL SHALLOW POOLS GENERALLY FOR TODDLERS AND SMALL CHILDREN. THESE ARE NORMALLY PLANNED AS ADJUNCTS TO MAIN POOLS (SEE CC 740 53 SWIMMING POOL; INDOOR). THIS CODE IS FOR INVENTORY PURPOSES AND ONLY IN THOSE CASES WHERE WADING POOLS ARE DETACHED FROM THE MAIN FACILITY.	
75036	1351	LS	EA	[MI]		TV COMM LINES	N	CATEGORY CODES 750 35 AND 750 36 ARE FOR INVENTORY PURPOSES ONLY. SUCH FACILITIES ARE PROVIDED ONLY AT REMOTE INSTALLATIONS WHERE CENTRAL TV RECEPTION AND LOCAL DISTRIBUTION SYSTEMS CAN BE INDIVIDUALLY JUSTIFIED.	
75037	7542	S	[EA]			OUTDR ADVENTR AREA	N	INCLUDES ROPES COURSES, NATURAL RECREATION FEATURES (ROCK CLIMBING, HIKING TRAILS, MOUNTAIN BIKE TRAILS, PAINTBALL RANGES, MOTOCROSS/BMX AREAS).	
75038	4521	S	[SY]	EA		OUTDR MWR EQUIP RNTL STO	Y	OUTDOOR FENCED AREA WITH LIGHTING FOR STORAGE OF MWR RENTAL EQUIPMENT (NOT ENCLOSED). FACILITY SHOULD BE CO-LOCATED WITH THE OUTDOOR RECREATION CENTER CCN 740-37, IF THERE IS ONE.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
75039	8523	LS	[SY]		EA	MWR VEH/ RV/ BOAT STO CPD	Y	THIS CATCODE IS FOR FENCED IN AREA FOR THE STORAGE OF PERSONAL WATER CRAFT, BOATS, TRAILERS, CAMPERS, MOTOR HOMES, ETC. AND OPERATED BY MWR.	
75040	7513	S		EA	[HO]	GOLF COURSE	Y	GOLF COURSES ARE RECREATIONAL FACILITIES WHICH MAY ACCOMMODATE: RECREATIONAL GOLFING, PRACTICE, INSTRUCTION, TOURNAMENTS, EXHIBITIONS, SPECIAL EVENTS, AND WINTER RECREATIONAL ACTIVITIES SUCH AS CROSS-COUNTRY SKIING, ICE SKATING, SLEDDING AND TOBOGGANING.	
75050	7532	S		EA	[SE]	OUTDOOR THEATER	Y	AN OUTDOOR THEATER MAY EITHER BE DRIVE OR WALK IN, AND IS USED PREDOMINANTLY TO SHOW FILMS.	
75052	7542	S	[EA]			SKEET AND/OR TRAP RANGE	Y	A SHOOTING RANGE TO ENGAGE IS THE SPORTS OF SKEET AND TRAP SHOOTING. A BUILDING MAY BE INCLUDED IF THE FACILITY CAN BE SELF SUSTAINING.	
75054	7531	S	SF	[EA]		BAND STAND	N	A RAISED PLATFORM USED BY BANDS OR FOR OTHER PUBLIC ENTERTAINMENT ACTIVITIES.	
75056	7514	S	[EA]			GOLF DRIVING RANGE	Y	USUALLY ASSOCIATED WITH A GOLF COURSE, THIS FACILITY ALLOWS THE GOLFER TO PRACTICE HITTING GOLF BALLS.	
75057	7516	S	[EA]			MWR REC GRNDS	Y	THIS FACILITY INCLUDES PARKS, PLAYGROUNDS, OR PICNIC AREAS AND RECREATION PAVILIONS (CODE 740 78). OPERATED BY MWR.	
75058	7541	S	AC	[EA]		REC CAMPGRND TENT	Y	PLEASE SEE CCN 750-59 FOR GENERAL DESCRIPTION OF CAMPGROUND. THIS CCN WILL BE USED FOR TENT CAMPING, NO VEHICLE PADS ARE REQUIRED.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
75059	7541	S	[AC]		EA	REC CAMPGROUND - RV	Y	RECREATIONAL CAMPGROUNDS PROVIDE THE MILITARY COMMUNITY WITH OUTDOOR RECREATION OPPORTUNITIES AT LOCATIONS WITH ATTRACTIVE NATURAL RESOURCES. TO COMPLEMENT THE CAMPING EXPERIENCE, AND DEPENDING ON LOCATION, RECREATIONAL CAMPGROUNDS MAY OFFER ACTIVITIES SUCH AS BOATING, CANOEING, FISHING, HIKING, HUNTING, SKIING AND SWIMMING.	
75060	7518	S	[EA]			MARINA/BOAT RAMP	Y	THIS CATCODE IS FOR A WATERFRONT FACILITY PROVIDING RENTAL BOATS, A BOAT LAUNCH, AND OTHER WATERFRONT AMENITIES. OPERATED BY MWR.	
75061	7517	S	[EA]		LF	RECREATIONAL PIER	Y	THIS CCN IS USED FOR STAND-ALONE RECREATIONAL PIER FACILITIES (E.G. FISHING PIERS) WHERE THERE IS NO EXISTING MARINA.	
751						OUTDOOR RECREATION FAC			
75110	7511	S	[EA]			PLAYGROUNDS	N	PLAYGROUNDS ARE OUTDOOR ACTIVITY AREAS PROVIDED FOR CHILDREN AND ARE AN INTEGRAL PART OF THE FUNCTIONS ASSOCIATED WITH SCHOOLS, FAMILY HOUSING AREAS, OUTDOOR ATHLETIC AND RECREATIONAL AREAS, AND CHILD DEVELOPMENT, SCHOOL AGE CARE AND YOUTH CENTERS.	
752									
75240	7524	S	[EA]			ATHLETIC STADIUM	N	A SPORTS ARENA USED FOR ATHLETIC ACTIVITIES AND INCLUDES AN ATHLETIC FIELD AND PERMANENTLY CONSTRUCTUED FEATURES THAT CAN INCLUDE SPECTATOR SEATING, GRANDSTANDS, PRESS BOXES/ANNOUNCER BOOTHS, CONCESSIONS STANDS AND SUPPORTING FEATURES BASED ON THE ACTIVITY TYPE. LIGHTING AND FENCING ARE CAPTURED UNDER OTHER CCNS.	
753									
754									

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
760						MUSEUMS AND MEMORIALS			
76010	7601	B	[SF]	EA		MUSEUMS / MEMORIAL BLDG	Y		NO SPECIFIC PLANNING FACTORS ARE AVAILABLE FOR THIS GROUP. REQUIREMENTS FOR EACH OF THE ABOVE FACILITIES WILL BE ESTABLISHED BASED ON INDIVIDUAL STUDIES AND SUPPORTING JUSTIFICATION. MUSEUMS MUST BE APPROVED BY SECNAV.
76020	7602	S		[EA]		OUTDOOR MONUMENT/MEMORIA L	N		THIS CATCODE IS FOR STATUES, MONUMENTS, PLAQUES ETC. COMMEMORATING SPECIAL EVENTS, LOCATIONS OR PEOPLE. THE OFFICE OF THE COMPTROLLER OF THE NAVY HAS RULED THAT THE USE OF APPROPRIATED FUNDS (INCLUDING OM&N FUNDS) FOR THE CONSTRUCTION AND MAINTENANCE OF MEMORIALS IS RESTRICTED TO THOSE MEMORIALS SPECIFICALLY APPROVED BY CONGRESSIONAL AUTHORITY.
76030	7603	S	AC	[EA]		CEMETERY	N		NO SPECIFIC PLANNING FACTORS ARE AVAILABLE FOR THIS GROUP. REQUIREMENTS FOR EACH OF THE ABOVE FACILITIES WILL BE ESTABLISHED BASED ON INDIVIDUAL STUDIES AND SUPPORTING JUSTIFICATION. SECNAV APPROVAL WILL BE REQUIRED.
800						UTILITIES & GROUND IMPRVMT			
810						ELECTRIC POWER			
811						ELECTRIC POWER- SOURCE			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
<p>Electric power for base facilities operation is normally derived from local commercial sources. Where commercial sources are used, transformer substations are required to transform the electrical energy to satisfy the station's load requirement. Where commercial electricity is not available, power plants will be planned. Standby generator plants are planned to provide adequate uninterrupted power supply in emergencies. Planning for power plants will include the building, the power generating equipment, and supporting appurtenances such as fuel storage for plant operation, auxiliary power, and switching stations.</p>									
81109	8910	B	[SF]			ELECTRIC POWER PLANT BLDG	N		THIS CATEGORY CODE IS USED FOR BUILDINGS ASSOCIATED WITH AN ELECTRIC POWER PLANT INCLUDING CATEGORY CODES 811 10, 811 25, 811 45, 811 46, AND 81150.
81110	8111	S		[KW]		ELECTRIC PWR PLNT - DIESEL	N		A CENTRAL PLANT FOR THE PRODUCTION OF ELECTRICITY USING DIESEL GENERATORS.
81125	8111	S		[KW]		ELECTRIC POWER PLANT-STEAM	N		A CENTRAL PLANT FOR THE PRODUCTION OF ELECTRICITY USING STEAM TURBINE GENERATORS.
81145	8111	S		[KW]		ELECTRIC POWER PLT-GAS TUR	N		A CENTRAL PLANT FOR THE PRODUCTION OF ELECTRICITY USING GAS FIRED TURBINE GENERATORS.
81146	8114	S		[KW]		WIND TURBINE	N		A SOURCE FOR THE PRODUCTION OF ELECTRICITY USING WIND TURBINES.
81150	8115	S		[KW]		ELEC POWER PHOTO SYSTEM	N		A SOURCE FOR THE PRODUCTION OF ELECTRICITY USING PHOTOVOLTAIC PANELS.
81159	8910	B	[SF]			STANDBY GENERATOR BLDG	N		THIS CATEGORY CODE IS USED FOR BUILDINGS ASSOCIATED WITH A STANDBY GENERATOR PLANT (811 60).
81160	8112	S		[KW]		STANDBY GENERATOR PLANT	N		STANDBY GENERATORS ARE USED TO PROVIDE ELECTRICAL POWER WHEN THE NORMAL SOURCE OF POWER IS NOT AVAILABLE.
812						ELECT TRANSMN/DISTR LINES			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
81209	8910	B	[SF]			ELECTRIC DISTRBN BLDG	N	THIS CATEGORY CODE SHOULD BE USED FOR BUILDINGS ASSOCIATED WITH ELECTRIC DISTRIBUTION SYSTEM THAT ARE NOT INCLUDED UNDER SWITCHING STATION/SUBSTATION BUILDINGS, CATEGORY CODE 813 10.	
81212	8133	S			[KV]	TRANSFORMERS	N	TRANSFORMERS TRANSFORM ELECTRICAL POWER ON THE PRIMARY SIDE TO A LOWER OR HIGHER VOLTAGE ON THE SECONDARY SIDE TO SERVE A FACILITY OR SEVERAL FACILITIES.	
81220	8122	S	[LF]	EA		EXT LIGHTING, POLE MT	N	UNIFORM POLE MOUNTED ILLUMINATION AT INSTALLATIONS, INCLUDING PERIMETER AND INTERIOR LIGHTING.	
81231	8121	LS	[LF]			OVERHLD ELEC DIST LINES	N	THE OVERHEAD LINES ARE FOR THE TRANSMISSION OF ELECTRICAL POWER BETWEEN SOURCE, SUBSTATIONS AND SWITCHING STATIONS, AND END USERS.	
81232	8123	LS	[LF]			UNDERGRD ELEC DIST LINES	N	THE UNDERGROUND LINES ARE FOR THE TRANSMISSION OF ELECTRICAL POWER BETWEEN SOURCE, SUBSTATIONS AND SWITCHING STATIONS, AND END USERS.	

813  
ELECTRIC PWR-  
SUB/SWCH STA

This Category Code is used for the buildings associated with a substation or switching station (813 20 or 813 30). These are the buildings that contain the switchgear, batteries, charging panels and other equipment located within the substation or switching station.

81310	8910	B	[SF]			SWITCHG SUB/SUBSTA BLDG	N	THIS CATEGORY CODE IS USED FOR THE BUILDINGS ASSOCIATED WITH A SUBSTATION OR SWITCHING STATION (813 20 OR 813 30).
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## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
81320	8131	S	[KV]			SUBSTATIONS	N	DISTRIBUTION SUBSTATIONS, NORMALLY CONSISTING OF TRANSFORMERS AND THEIR ASSOCIATED SWITCHGEAR, STRUCTURES, BUSES, GROUNDING SYSTEMS, AND PROTECTIVE DEVICES; TRANSFORM ELECTRICAL POWER TO A LOWER OR HIGHER VOLTAGE AND PUT IT ON THE DISTRIBUTION SYSTEM.	
81330	8132	S	[KV]	EA		SWITCHG STA/SECT DIST CIRC	N	A SWITCHING STATION IS EQUIPMENT IN AN ELECTRIC DISTRIBUTION SYSTEM WHERE ELECTRIC POWER IS SWITCHED WITHOUT TRANSFORMATION. SWITCHING STATIONS ARE LOCATED AT POINTS WHERE IT IS NECESSARY TO BRANCH OFF FROM A MAIN FEEDER OR FEEDERS WITH SMALLER COMPONENTS DUE TO PHYSICAL LOCATION OF THE FACILITIES TO BE SERVED OR TO ISOLATE PORTIONS OF FEEDERS FOR MAINTENANCE OR REPAIR.	
81340	8134	S	[EA]			LGHTNG PROT SYS	N	STANDALONE LIGHTNING PROTECTION SYSTEMS ARE THOSE THAT ARE NOT INCLUDED AS PART OF A SPECIFIC FACILITY'S INSTALLED EQUIPMENT. THESE ARE USUALLY CONSTRUCTED TO PROTECT A COMPOUND, A SINGLE BUILDING (WHERE THE SYSTEM IS CONSTRUCTED OF MASTS AND IS NOT A PART OF THE FACILITY) OR SERIES OF BUILDINGS. UM IS "EA", WHICH CONSTITUTES UP TO FOUR LIGHTNING PROTECTION MASTS/STRUCTURES. FOR SYSTEMS WITH MORE THAN FOUR, INCREASE UM QUANTITY ACCORDINGLY.	
820						HEAT & REFRIGERATION(A/ C)			
821						HEAT-SOURCE			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
<p>The source of heat from steam or high temperature water (HTW) includes a complete central plant and associated fuel storage. The source of heat and steam/HTW are coded to indicate the type of fuel used by the plant. A central heating plant will include a structure, piping, equipment, controls, fuel, storage, and all equipment necessary to make a complete usable facility. Central heating plants are justified only when the total owning and operating costs for central plants and distribution systems are less than similar costs for heating systems in individual buildings. Central heating plants are also justified when the overall energy use for providing heat from extraction steam in a steam-electric-power plant would be less than a central plant plus purchased electricity. The type of fuel for the plant, whether an electric power generating plant with by-product heat and steam, or a heating plant, will be selected on the basis of an economic analysis. The heating plant capacity will be based on BTU rating, and this rating will be determined from an engineering analysis of the need for steam, heat, and hot water at the station.</p>									
82109	8910	B	[SF]			HEATING PLANT BUILDING	N		THIS CATEGORY CODE IS USED FOR BUILDINGS ASSOCIATED WITH A HEATING PLANT INCLUDING CATEGORY CODES 821 12, 821 22, OR 821 30.
82112	8211	S		[BH]		HTG PLNT - OIL/GAS	N		THIS CATEGORY CODE IS USED FOR A PLANT THAT UTILIZES OIL OR GAS FOR THE PRODUCTION AND DISTRIBUTION OF HEAT. THIS INCLUDES STEAM, HOT WATER, HIGH PRESSURE/LOW PRESSURE, ETC., SERVING MORE THAN ONE SEPARATE FACILITY.
82122	8211	S		[BH]		HTG PLNT-COAL	N		THIS CATEGORY CODE IS USED FOR A PLANT THAT UTILIZES COAL FOR THE PRODUCTION AND DISTRIBUTION OF HEAT. THIS INCLUDES STEAM, HOT WATER, HIGH PRESSURE/LOW PRESSURE, ETC., SERVING MORE THAN ONE SEPARATE FACILITY.
82130	8211	S		[BH]		NON-FOSL FUEL HTG PLT	N		THIS CATEGORY CODE IS USED FOR A PLANT THAT UTILIZES A NON-FOSSIL FUEL FOR THE PRODUCTION AND DISTRIBUTION OF HEAT. THIS INCLUDES STEAM, HOT WATER, HIGH PRESSURE/LOW PRESSURE, ETC., SERVING MORE THAN ONE SEPARATE FACILITY.



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
82140	8211	S	[BH]			NUCLEAR STEAM PLANT-ALL	N	THIS CATEGORY CODE IS USED FOR A PLANT THAT UTILIZES NUCLEAR FUEL FOR THE PRODUCTION AND DISTRIBUTION OF HEAT. THIS INCLUDES STEAM, HOT WATER, HIGH PRESSURE/LOW PRESSURE, ETC., SERVING MORE THAN ONE SEPARATE FACILITY.	
82150	8211	S	[BH]			NON-NUCLEAR STEAM PLANT	N	TO BE DELETED	
82160	1244	S	[GA]			DISTILATE HEATING FUEL OIL	N	THIS CATEGORY CODE IS USED FOR FUEL OIL TANKS USED FOR HEATING BUILDINGS, GENERATION OF STEAM, POWER PLANT REQUIREMENTS, AND FOR OTHER HEAT GENERATING FACILITIES AS REQUIRED.	
82161	1244	S	[GA]			RESIDUAL HEATING OIL STG	N	THIS CATEGORY CODE IS USED FOR FUEL OIL TANKS USED FOR HEATING BUILDINGS, GENERATION OF STEAM, POWER PLANT REQUIREMENTS, AND FOR OTHER HEAT GENERATING FACILITIES AS REQUIRED. NO. 4 FUEL OIL, NO. 5 FUEL OIL AND NO. 6 FUEL OIL ARE VARIOUSLY REFERRED TO AS RESIDUAL FUEL OILS.	

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822

HEAT-  
TRNSMSN/DISTR  
LINES

This basic category encompasses the transmission and distribution lines for steam and associated hot water lines throughout an installation. In temperate and tropical climates and at locations where the water table is high, steam lines will be aboveground. Routing of steam or hot water lines requiring underground installation under runways and taxiways should be held to a minimum to avoid interference by maintenance and repair operations. Adequate clearances shall be provided above roads, railroads, streets, walks, and tow-ways.

82209	8910	B	[SF]			STEAM DIST SYSTEM BLDG	N	BUILDINGS ASSOCIATED WITH A HEATING DISTRIBUTION SYSTEM (CATEGORY CODES 822 12, 822 14, 822 16 OR 822 26). THE REQUIREMENT FOR STEAM AND CONDENSATE OR HOT WATER PIPELINES IS DETERMINED FROM AN ENGINEERING STUDY.
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## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
82315	8910	B	[SF]			GAS METER BLDG	N	THIS CATEGORY CODE CONTAINS BUILDINGS ASSOCIATED WITH GAS METERING.	
82320	8232	S		EA	[CF]	GAS STORAGE TANKS	N	THIS CATEGORY CODE CONTAINS TANKS FOR THE STORAGE OF LIQUID NATURAL GAS AND/OR PROPANE CONNECTED TO A GAS DISTRIBUTION SYSTEM SERVING MULTIPLE FACILITIES.	
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824						HEAT, GAS - TRANSMISSION			
This basic category applies to exterior lines, mains, and systems for transmission of gas for direct heating or as fuel for central plants.									
82410	8241	LS		[LF]		GAS MAINS	N	THIS CATEGORY CODE IS FOR THE MAIN GAS LINES (PIPES) THAT CARRY THE BULK OF THE GAS TO AND FROM FACILITIES AT AN INSTALLATION.	
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826						REFRIGERATION/AI R CONDING			
This category code group is for chilled water and air conditioning plants Exclude cold storage facilities (see Category Code 430 series).									
82610	8910	B	[SF]		TN	COOLING SYS PLANT BLDG	N	BUILDINGS ASSOCIATED WITH A COOLING SYSTEM PLANT (CATEGORY CODE 826 20).	
82620	8261	S		[TR]		COOLING SYSTEM PLANT	N	A PLANT FOR THE PRODUCTION AND DISTRIBUTION OF A CHILLED FLUID FOR MORE THAN ONE SEPARATE FACILITY.	
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827						C/W-A/C TRNSMSN/DISTRBN			
This basic category encompasses the transmission/distribution of chilled water from a central refrigeration/air conditioning plant to buildings throughout an installation for space air conditioning with water being returned to the plant. Routing of chilled water lines under runways, taxiways, and buildings should be held to a minimum to avoid interference by maintenance and repair operations to the chilled water lines. If lines are located above ground, adequate clearances shall be provided above roads, railroads, walks and tow-ways.									
82710	8910	B	[SF]			COOLING SYS VALVE BLDG	N	BUILDINGS ASSOCIATED WITH A COOLING DISTRIBUTION SYSTEM (CATEGORY CODE 827 20).	
82720	8271	LS		[LF]		CHILLED FLUID LINES	N	THIS CATEGORY CODE INCLUDES ASSETS PREVIOUSLY CONTAINED IN CCN 827 25.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
830						SEWAGE AND WASTE			
<p>Category group 830 describes the facilities required for the collection, transportation, treatment, and disposal of sewage and industrial waste, and disposal of storm drainage water in storm and sanitary sewer systems. Components of sewage and refuse facilities include sewage treatment plants, outfall sewer lines, septic tanks, septic tank drain fields, sanitary sewers, sewage pumping stations, and incinerators. Certain industrial waste must be kept separately and treated separately from the sanitary sewage. In planning for sewage and waste facilities cognizance shall be taken of the Federal Water Pollution Control Act as amended, applicable to municipalities, industries, and others that may contribute to the pollution of surface and underground waters in the United States.</p>									
831						SEWAGE-IND WASTE TRTMT&DSP			
<p>Plant Buildings, and sanitary sewage treatment plant will be necessary to provide for the processing of sanitary sewage for ultimate disposal. Disposal of sewage is usually in a stream or other body of water or on land by subsurface irrigation or by direct absorption into the soil. A sewage treatment plant may include aeration tanks or trickling filters, settling basins, sump or storage wells, dry wells, pumps, screens, and accessories. The type and capacity of sewage treatment plant is determined by an engineering study that considers planned population, number of family quarters, and industrial peak loads.</p>									
83109	8910	B	[SF]			SWGE TRMT BLDG	N		THIS CATEGORY CODE INCLUDES THE BUILDINGS ASSOCIATED WITH THE SEWAGE TREATMENT PLANT (CATEGORY CODE 831 10).
83110	8311	S		[KG]		SWGE TRMT PLT	N		THIS CATEGORY CODE IS USED FOR ALL TYPE OF SEWAGE TREATMENT PLANTS; PRIMARY, SECONDARY, OR TERTIARY.
83111	8313	S		[KG]		BALLAST CONTAMTN SKMR	N		A FACILITY TO REMOVE GREASE, OIL, AND OTHER CONTAMINENTS FROM THE WATER REMOVED FROM SHIP BALLAST TANKS.
83114	8910	B	[SF]			INDUSTRY WAST TREATMT BLDG	N		THIS CATEGORY CODE IS USED FOR BUILDINGS ASSOCIATED WITH AN INDUSTRIAL WASTEWATER TREATMENT PLANT (CATEGORY CODE 831 15).

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
83115	8312	S	[KG]			INDUSTRY WAST TREATMT FAC	N	THIS CAT CODE IS USED FOR A DEDICATED INDUSTRIAL WASTEWATER TREATMENT PLANT. ALL THE PLANT EQUIPMENT; EQUALIZATION, PRELIMINARY TREATMENT, CLARIFICATION, HOLDING TANKS, BIOLOGICAL TREATMENT, CHEMICAL TREATMENT, FILTRATION, DISINFECTION, DEWATERING, DIGESTION, SLUDGE DISPOSAL, ELECTRICAL SYSTEM, CONTROLS, COMPRESSED AIR, STORAGE, AND COMS, IS INCLUDED AS A SINGLE WASTEWATER TREATMENT PLANT.	
83116	8313	S	[KG]			OIL / WATER SEPARATOR	N	THIS CATEGORY CODE IS USED FOR OIL/WATER SEPARATORS THAT DISCHARGE TO THE SANITARY SEWER OR INDUSTRIAL WASTE COLLECTION SYSTEM. OIL/WATER SEPARATORS BELONG TO THE FACILITY WHICH IT SERVES.	
83120	8321	LS	[KG]	LF		OUTFALL SEWER LINE	N	AN OUTFALL SANITARY SEWER LINE RECEIVES THE SEWAGE FROM A COLLECTING SYSTEM OR THE EFFLUENT FROM A SANITARY SEWAGE PLANT AND CARRIES IT TO A POINT OF FINAL DISCHARGE. PLANNING FOR OUTFALL SEWER LINES WILL INCLUDE LAND ACQUISITION.	
83130	8314	S	KG	[GA]		SEPTIC TANK/DRAIN FIELD	N	A SEPTIC TANK AND DRAIN FIELD FACILITY PROVIDES SEWAGE TREATMENT FOR HUMAN WASTE AT ISOLATED FACILITIES WHERE AN EXTENSION OF THE CENTRAL SEWER COLLECTION SYSTEM WOULD NOT BE ECONOMICALLY FEASIBLE. A SEPTIC TANK AND DRAIN FIELD WILL INCLUDE A CONCRETE OR PROTECTED STEEL TANK, A DRAIN FIELD SYSTEM INCLUDING HEADERS, LATERALS, OPEN JOINT CLAY OR CONCRETE PIPE, GRAVEL, DITCHING, AND LAND ACQUISITION.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
83131	8315	S		GA	[KG]	SEPTIC LAGOON &/OR POND	N	A STRUCTURE USED FOR COLLECTING AND HOLDING SEWAGE TO ALLOW FOR SETTLEMENT AND EVAPORATION. THESE STRUCTURES ARE TYPICALLY CONCRETE ENCASED.	
83139	8910	B	[SF]			RADIOACTV WASTE HANDL BLDG	N	RADIOACTIVE WASTE HANDLING BUILDING.	
83140	8926	S		[EA]		RADIOACTV WASTE HANDL FAC	N	RADIOACTIVE WASTE HANDLING FACILITY.	
83141	8926	S	[SF]		EA	HAZARD WSTE STOR & TRANSFR	N	A STORAGE FACILITY FOR THE CONTAINMENT AND SHIPMENT OF HAZARDOUS WASTES. CAN BE SHORT TERM (HW STORAGE LESS THAN 90 DAYS) OR LONG TERM (HW STORAGE 90 DAYS OR MORE).	
83142	8926	S	[SY]		EA	HAZARD WASTE STORAGE AREA	N	AN EXTERIOR LAYDOWN AREA FOR THE STORAGE OF HAZARDOUS WASTE MATERIALS THAT DO NOT POSE ANY THREATS TO THE ENVIRONMENT VIA CONTAMINATED RUNOFF.	
83143	4423	B	[SF]			HAZ WASTE BLDG	Y	A BUILDING THAT HAS BEEN PROPERLY CERTIFIED TO STORE SUBSTANCES THAT CANNOT LEGALLY BE DISPOSED OF IN A NORMAL SANITARY LANDFILL OR INTO A REFUSE INCINERATOR DESIGNATED TO HANDLE MUNICIPAL TYPE REFUSE, OR CANNOT BE DISCHARGED INTO A SANITARY SEWERAGE SYSTEM.	

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832 SEWAGE/IND WASTE  
COLLECTN

This basic category includes collection systems and lines including pumping stations for sewage and industrial waste and collection of storm drainage in combined storm and sanitary sewer systems. Planning for the sanitary sewer system will include piping, fittings, pumps, lift stations, and accessories. A sanitary sewer collection system will be required at all Naval installations and it will be based primarily on the population. The requirements will be determined by an engineering survey.

83210	8321	LS		[LF]		SANITARY SEWER LINE	N	ALL DISTRIBUTION SYSTEM PIPES THAT COLLECT AND TRANSPORT SANITARY SEWAGE. TYPES INCLUDE GRAVITY OR FORCED MAIN SYSTEMS.
83220	8321	LS		[LF]		COMBINED SEWER LINE	N	ALL DISTRIBUTION PIPES THAT COLLECT AND TRANSPORT BOTH SANITARY SEWAGE AND STORM WATER.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
83229	8910	B	[SF]			SEWAGE PUMP STA BLDG	N	BUILDINGS ASSOCIATED WITH A SEWAGE PUMP STATION. THE PRIMARY UNIT OF MEASURE IS SQUARE FEET (SF).	
83230	8316	S		EA	[GM]	SEWAGE WASTE PUMPG STA	N	A SEWAGE PUMPING STATION IS A FACILITY USED TO MOVE SEWAGE THROUGH MAINS TO A TREATMENT PLANT, TO SERVE WHERE A GRAVITY SYSTEM IS NOT FEASIBLE, AND/OR TO LIFT SEWAGE FROM ONE LEVEL TO ANOTHER IN A GRAVITY SYSTEM.	
83231	8316	S		[EA]		SEWAGE LIFT STATIONS	N	A SEWAGE LIFT STATION IS A FACILITY USED TO MOVE SEWAGE THROUGH MAINS TO A TREATMENT PLANT, TO SERVE WHERE A GRAVITY SYSTEM IS NOT FEASIBLE, AND/OR TO LIFT SEWAGE FROM ONE LEVEL TO ANOTHER IN A GRAVITY SYSTEM.	
83240	8321	LS		[LF]		INDUSTRIAL WASTEWTR LN	N	THIS CATEGORY CODE INCLUDES ALL DISTRIBUTION SYSTEM PIPES THAT COLLECT AND TRANSPORT INDUSTRIAL WASTEWATER. TYPES INCLUDE GRAVITY OR FORCED MAIN.	
83241	8316	S		[EA]		IND WASTE WATER PUMP STAT	N	FACILITIES USED TO TRANSPORT WASTE STREAMS TO HOLDING TANKS OR INDUSTRIAL WASTE TREATMENT PLANTS, TO SERVE WHERE A GRAVITY SYSTEM IS NOT FEASIBLE, AND/OR TO LIFT WASTE STREAMS FROM ONE LEVEL TO ANOTHER IN A GRAVITY SYSTEM.	
833						SOLID WASTE HANDLING FAC			
83309	8332	S	SF	[TH]		INCINRTR BLDG & INCINRTR	N	BUILDINGS ASSOCIATED WITH AN INCINERATOR. AN INCINERATOR IS A FACILITY FOR BURNING COMBUSTIBLE REFUSE TO REDUCE IT TO STABLE GASES AND INERT SOLIDS.	
83310	8332	S		[TH]		INCINERATOR - EXTERIOR	N	AN INCINERATOR IS A FACILITY FOR BURNING COMBUSTIBLE REFUSE TO REDUCE IT TO STABLE GASES AND INERT SOLIDS. AN EXTERIOR INCINERATOR IS ONE THAT IS NOT ENCLOSED IN A STRUCTURE.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
83315	8333	S	AC	[EA]		SANITARY/CUT-FIL DISP AREA	N	LANDFILLS ARE LINED (USUALLY WITH CLAY) EXCAVATIONS IN WHICH SOLID WASTES ARE BURIED, COVERED AND MONITORED. LANDFILLING SOLID WASTE IS THE TECHNOLOGY OF LAST RESORT. CONSULT EPA AND STATE REGULATIONS AND THE LATEST SOLID WASTE TEXT BOOKS FOR ENGINEERING PRINCIPLES AND PRACTICES IN SITING AND SCOPING A LANDFILL.	
83320	8331	S	SF	[TN]	EA	GARBAGE GRINDER BLDG	N	A GARBAGE GRINDER FACILITY THAT IS FULLY ENCLOSED BY A BUILDING.	
83321	8331	S		[TN]	EA	GARBAGE GRINDER	N	A GARBAGE GRINDER FACILITY THAT IS PARTIALLY ENCLOSED BY AN OPEN STRUCTURE.	
83330	8526	LS	SY	[EA]		GARBAGE STAND	N	AN OPEN STRUCTURE USED TO PARTIALLY ENCLOSE TRASH RECEPTACLES, USUALLY DUMPSTERS.	
83340	8910	B	[SF]			GARBAGE/RECYCLE BUILDING	N	SMALL BUILDING USED FOR TEMPORARY STORAGE OF TRASH OR RECYCLABLES PRIOR TO REMOVAL AND PROCESSING BY A COLLECTION SERVICE.	

840

### WATER

Water facilities at naval installations shall provide sufficient quantities of potable water for domestic and industrial use; purification of raw water from deep wells, lakes, and rivers; storage of water in bulk storage tanks or reservoirs; and distribution of water to demand areas. Facilities included are Wells, pre-treatment supply mains, pumping, treatment and filtration plants, plant buildings, tanks, and storage for potable water. For separate fire protection systems, see basic category code 843.

841

POTABLE WATER-  
SUP/TMT/STRG



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
<p>Planning for the treatment of water will include, as applicable, screening, settling, coagulation and sedimentation, filtration, disinfection, softening, and aeration. The water treatment systems are normally planned in millions of gallons (MG) per day capacity and distribution is in linear feet (LF). The systems must be adequate to meet the domestic and industrial requirements and to provide fire protection if a separate fire protection system is not provided. If separate demand (see Code 843). Planning requirements for water treatment facilities will be based on the results of an engineering survey and an economic analysis to determined sources of water versus commercial or municipal supply. nonpotable water protective systems are not provided, the capacity of the water supply system will be determined by the fire flow</p>									
84109	8910	B	[SF]			WATER TREATMENT FAC BLDG	N	THIS CATEGORY CODE INCLUDES BUILDINGS ASSOCIATED WITH A WATER TREATMENT PLANT (841 10), DESALINIZATION PLANT (841 25), OR WELLS - POTABLE WATER (841 50).	
84110	8412	S	[KG]			WATER TREATMENT FACILITIES	N	A WATER TREATMENT PLANT IS A FACILITY THAT TREATS WATER TO MAKE IT SAFE FOR HUMAN CONSUMPTION (POTABLE). THIS CATEGORY CODE INCLUDES THE STRUCTURES, EQUIPMENT, AND PROCESSES REQUIRED TO TREAT POTABLE WATER. WATER TREATMENT PLANT BUILDINGS ARE CLASSIFIED AS 841 09.	
84115	8412	S	[KG]			NUCL WATER TREATMT FAC	N	NO CRITERIA FOR THIS FACILITY ARE CURRENTLY AVAILABLE.	
84120	8421	LS	[LF]	GM		WATER SUPPLY LINE	N	THE PIPE THAT CONVEYS WATER FROM SOURCE TO POINT OF TREATMENT OR TO THE POINT OF CONSUMPTION. A PRESSURE MAIN WILL BE NEEDED IF THE WATER IS PUMPED. HOWEVER, IF TOPOGRAPHY PERMITS, A GRAVITY SYSTEM IS PLANNED.	
84125	8415	S	[KG]			DESALINIZATION PLANT	N	A WATER TREATMENT PLANT THAT UTILIZES A PROCESS, SUCH AS DISTILLATION, REVERSE OSMOSIS, OR ELECTRO DIALYSIS, THAT REMOVES DISSOLVED MINERAL SALTS AND OTHER DISSOLVED SOLIDS FROM WATER.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
84130	8413	S				[GA] ELEVTD POTABLE WATER TANK	N	WATER STORAGE TANKS FOR POTABLE WATER ARE ELEVATED OR GROUND-LEVEL STRUCTURES USED TO STORE BULK QUANTITIES OF POTABLE WATER. ELEVATED TANKS FOR POTABLE WATER PROVIDE BOTH STORAGE AND STATIC PRESSURE FOR THE DISTRIBUTION SYSTEM. GROUND-LEVEL TANKS ACCOMMODATE PEAK DEMAND REQUIREMENTS WITHOUT AFFECTING THE CAPABILITY OF THE SOURCE.	
84140	8413	S				[GA] GRND LVL POTABL WATER TANK	N	WATER STORAGE TANKS FOR POTABLE WATER ARE ELEVATED OR GROUND-LEVEL STRUCTURES USED TO STORE BULK QUANTITIES OF POTABLE WATER. ELEVATED TANKS FOR POTABLE WATER PROVIDE BOTH STORAGE AND STATIC PRESSURE FOR THE DISTRIBUTION SYSTEM. GROUND-LEVEL TANKS ACCOMMODATE PEAK DEMAND REQUIREMENTS WITHOUT AFFECTING THE CAPABILITY OF THE SOURCE.	
84150	8414	S		[KG]	GM	WATER WELLS - POTABLE	N	EQUIPMENT THAT PUMPS WATER FROM UNDERGROUND SOURCES TO TREATMENTS PLANTS OR DIRECTLY TO DISTRIBUTION WITH MINOR TREATMENT.	
84151	8443	S				[MG] RESERVOIR - POTABLE WATER	N	AN OPEN BODY OF WATER FOR THE COLLECTION AND STORAGE OF WATER USED BY A WATER TREATMENT FACILITY OR WATER DISTRIBUTION SYSTEM.	
84152	8442	S	SY	LF	[GA]	WATER CATCHMENT STRUCTURE	N	A MAN-MADE STRUCTURE DESIGNED TO CAPTURE OR COLLECT RAINWATER AND USED TO PRODUCE POTABLE WATER.	
842						WATER-DISTRIBTN SYS POTABL			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
84209	8910	B	[SF]			WATER DISTRIBTN BLDG, PTBL	N	ALL BUILDINGS ASSOCIATED WITH THE DISTRIBUTION OF POTABLE WATER. POTABLE WATER WILL BE TRANSMITTED FROM A STORAGE TANK OR A TREATMENT PLANT TO ALL STATION DEMAND POINTS THROUGH A PIPELINE. THIS CATEGORY CODE INCLUDES BUILDINGS ASSOCIATED WITH THE DISTRIBUTION OF POTABLE WATER, TYPICALLY HOUSING DISTRIBUTION PUMPS AND EQUIPMENT.	
84210	8421	LS	[LF]			WATER DISTBTN LINE, POTBL	N	ALL PIPES THAT CONVEY POTABLE WATER FROM THE TREATMENT PLANT TO THE END USER.	
84215	8422	S		KG	[GM]	PUMP STATION - POTABLE	N	THIS CATEGORY CODE WILL INCLUDE THE PUMP(S) AND APPURTENANT PIPING, VALVES, AND OTHER MECHANICAL AND ELECTRICAL EQUIPMENT FOR PUMPING WATER IN THE POTABLE WATER SYSTEM.	

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843 WATER, FIRE  
PROTECTION

Fire protection requirements often dominate the plans of a water supply system. When the supply of fresh water is not adequate, salt water may be used. Since fire flow demands are usually greater than either the domestic or industrial demands, the capacity of the system will generally be determined by the fire flow demands. Fire flows are expressed in gallons per minute and are separate from the other water requirements.

84310	8432	LS	[LF]			FIRE PROTECTION LINES	N	FIRE PROTECTION PIPELINES ARE USED EXCLUSIVELY IN THE TRANSMISSION OF WATER FOR FIRE PROTECTION, NOT DOMESTIC USE.
84320	8434	S		KG	[GM]	FIRE PROTECTION PUMPG STA	N	A FIRE PROTECTION PUMPING STATION IS A COLLECTION OF PUMPS AND SUPPORTING EQUIPMENT USED TO INCREASE THE PRESSURE IN THE FIRE PROTECTION SYSTEM.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
84330	8435	S		MG	[GA]	FIRE PROTECTION WATER TANK	N	TANKS THAT PROVIDE FIRE PROTECTION WATER STORAGE TO ACCOMMODATE PEAK DEMAND REQUIREMENTS.	
84335	8433	S			[MG]	FIRE PROTECTION RESERVOIR	N	THIS CATEGORY CODE IS FOR A RESERVOIR THAT HAS A CAPACITY GREATER THAN OR EQUAL TO ONE MILLION GALLONS AND TYPICALLY PROVIDES A SUFFICIENT QUANTITY OF WATER IN RESERVE TO INSURE AN UNINTERRUPTED FLOW FOR FIRE PROTECTION.	
84340	8431	S			[GM]	FIRE PROTECTION WATER WELL	N	THIS CATEGORY CODE IS FOR EQUIPMENT THAT PUMPS WATER FROM UNDERGROUND SOURCES TO THE FIRE PROTECTION SYSTEM.	
84350	8910	B	[SF]			FIRE PROTECTION BLDG	N	THIS CATEGORY CODE INCLUDES BUILDINGS ASSOCIATED WITH THE DISTRIBUTION OF FIRE PROTECTION WATER, TYPICALLY HOUSING DISTRIBUTION PUMPS AND EQUIPMENT.	
844						WATER SUPPLY/STRG- NONPOTBL			
<p>The water from these facilities will be used primarily for industrial purposes or as an emergency supply should there be a failure of the principal source. When a requirement for nonpotable water source exists, firefighting water requirements usually will be combined with this group. Requirements for this facility group are similar to that for Category Group 841 and 843.</p>									
84410	8910	B	[SF]			WATER DIST BLDG, NONPOTB	N	THIS CATEGORY CODE INCLUDES ALL BUILDINGS ASSOCIATED WITH THE SUPPLY OR DISTRIBUTION OF NONPOTABLE WATER, TYPICALLY HOUSING DISTRIBUTION PUMPS AND EQUIPMENT.	
84420	8441	S		[KG]		WELLS - NONPOTABLE WATER	N	THIS CATEGORY CODE INCLUDES EQUIPMENT THAT PUMPS WATER FROM UNDERGROUND SOURCES TO A DEDICATED NONPOTABLE WATER DISTRIBUTION SYSTEM.	
84430	8452	S		[KG]		PUMP STA - NONPOTBL	N	THIS CATEGORY CODE INCLUDES THE COLLECTION OF PUMPS AND SUPPORTING EQUIPMENT USED TO SUPPLY WATER TO THE NONPOTABLE WATER SYSTEM	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
84440	8442	S				[GA] STORAGE TANKS- NONPOTBL WTR	N	THIS CATEGORY CODE INCLUDES TANKS THAT PROVIDE NONPOTABLE WATER STORAGE TO ACCOMMODATE PEAK DEMAND REQUIREMENTS.	
84450	8443	S				[MG] RESERVOIRS- NONPOTBL WATER	N	THIS CATEGORY CODE INCLUDES A RESERVOIR THAT HAS A CAPACITY GREATER THAN OR EQUAL TO ONE MILLION GALLONS AND TYPICALLY PROVIDES A SUFFICIENT QUANTITY OF WATER IN RESERVE TO INSURE AN UNINTERRUPTED FLOW FOR NONPOTABLE WATER REQUIREMENTS.	
845						WATER-DISTRBN SYS NONPOTBL			
Facilities in this group support non-potable water supply systems and are similar to those described under Category Group 842.									
84520	8451	LS				[LF] PIPELINE- NONPOTABLE WATER	N	THIS CATEGORY CODE INCLUDES ALL PIPES THAT TRANSMIT WATER IN A DEDICATED NONPOTABLE WATER DISTRIBUTION SYSTEM.	
850						ROADS AND STREETS			
851						ROADS			
Roads, streets, and incidental parking area, curbs and gutters and culverts for vehicular traffic, including highway and vehicular bridges.									
85110	8511	LS	[SY]	MI		ROADS	N	ROADS, STREETS, AND BRIDGES ARE GENERALLY PLANNED TO CONFORM TO THE STANDARDS AND PRACTICES OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS (AASHO), BUREAU OF PUBLIC ROADS (BPR), AND STATE AND LOCAL GOVERNMENTS.	
85111	8512	LS	[SY]		MI	ROADS, UNSURFACED	N	VEHICULAR ROADWAYS THAT DO NOT HAVE A PERMANENT/IMPERVIOUS SURFACE SUCH AS ASPHALT OR CONCRETE.	
85115	8928	S	[SF]	EA		LOAD / UNLOAD RAMP	N	A RAMP, USUALLY CONCRETE OR STEEL/IRON THAT IS UTILIZED TO ASSIST IN THE LOADING OF TRUCKS AND RAILCARS.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
85120	8513	S	[SY]	LF		VEHICULAR BRIDGES	N	BRIDGES ARE GENERALLY USED TO CROSS AREAS OF DIFFERING ELEVATIONS. GENERALLY THEY ARE PLANNED TO CONFORM TO THE STANDARDS AND PRACTICES OF THE AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS (AASHO), BUREAU OF PUBLIC ROADS (BPR), AND STATE AND LOCAL GOVERNMENTS.	
85121	8522	LS	[SY]			VEH. PARK, UNSURFACED	Y	AN AREA FOR PARKING PRIVATE AND/OR GOVERNMENT OWNED VEHICLES AND EQUIPMENT THAT DO NOT HAVE A PERMANENT/IMPERVIOUS SURFACE SUCH AS ASPHALT OR CONCRETE.	
85122	8523	LS	[SY]			VEHICLE STAGING AREA	N	AN AREA, PAVED OR UNPAVED, THAT IS FOR TEMPORARY STORAGE OF VEHICLES PRIOR TO SHIPMENT OR FURTHER DEPLOYMENT.	
85123	8541	S		[EA]		TRAFFIC CONTROL SIGNALS	N	DEVICES USED FOR DIRECTING PEDESTRIAN, VEHICULAR OR RAIL TRAFFIC BY MEANS OF POWER-OPERATED CONTROLS. COSTS INCLUDE SIGNAL DEVICES, NECESSARY SUPPORTS, AND ELECTRIC POWER CABLES AND ARE COUNTED PER INTERSECTION.	
85125	8514	LS			[LF]	VEHICULAR TUNNEL	N	VEHICULAR TUNNELS ARE USED FOR SLOPE STABILIZATION AND AUTOMOBILE ACCESS IN AREAS WHERE STEEP SLOPES LIMIT DEVELOPMENT AND REQUIRE INNOVATIVE ACCESS SOLUTIONS. THESE TUNNELS SERVE VEHICULAR AND PEDESTRIAN TRAFFIC AS WELL AS HOUSING UTILITY RUNS.	
852						SIDEWALKS & OTHER PAVEMENT			
Walks and stairs for pedestrian traffic including pedestrian bridges, separate parking lots, and paved or stabilized areas for vehicular use and work or service areas.									
85210	8521	LS	[SY]			PARKING AREA	Y	THE PAVED AND/OR STABILIZED AREA WITHIN AN ORGANIZATIONAL MOTOR POOL AND PARKING LOT,	
85215	7384	S	[SF]			BICYCLE SHELTER	Y	A STRUCTURE USED FOR TEMPORARY PARKING OF BICYCLES.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
85220	8524	S	[SY]			SIDEWALK	N	A PATHWAY CONSTRUCTED TO SUPPORT PEDESTRIAN TRAFFIC. CONSTRUCTION IS OF CONCRETE, ASPHALT, PAVING BLOCKS, GRAVEL, OR THE LIKE.	
85230	8525	S	[SY]	LF		PEDESTRIAN BRIDGES	N	BRIDGES THAT SUPPORT WALKWAY CROSSING OF A RIVER, UNDERPASS, OR SIMILAR GAP.	
85235	8526	LS	[SY]			OTHER PAVED AREA	N	THIS CODE IS FOR MISCELLANEOUS VEHICULAR PAVEMENTS NOT CAPTURED IN OTHER 100 OR 400 SERIES CATEGORY CODES.	
85240	8526	LS	[SY]			MISC OPEN STRG/LAYDOWN	N	THIS CODE IS FOR OPEN STORAGE AREAS OTHER THAN THOSE USED FOR GENERAL SUPPLY OPERATIONS (CATEGORY CODE 451 10). IT INCLUDES PUBLIC WORKS OPEN STORAGE FACILITIES.	
85241	8526	LS	SY	[EA]		BLDG/TRLR PAD W/ UTIL CNCT	N	PAVED SURFACE CONSTRUCTED TO SUPPORT A TEMPORARY FACILITY OR TRAILER. UTILITY CONNECTIONS ARE PART OF THE TRAILER PAD REQUIREMENTS AND ALLOW TEMPORARY FACILITIES (OFTEN CLASS 3 PROPERTY) TO BE EASILY INSTALLED.	
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853	PARKING BLDG								
A structure or building designed for parking private and/or government owned vehicles and equipment in individual parking spots/locations. The facility may be above ground or underground. The parking building should be justified by land restrictions and economic considerations. Allow 33 m2/ 40 SY for each passenger vehicle.									
85310	8531	S	[SF]	VE		PARKING BLDG	Y	A STRUCTURE OR BUILDING DESIGNED FOR PARKING PRIVATE AND/OR GOVERNMENT OWNED VEHICLES AND EQUIPMENT IN INDIVIDUAL PARKING SPOTS/LOCATIONS. THE FACILITY MAY BE ABOVE GROUND OR UNDERGROUND. THE PARKING BUILDING SHOULD BE JUSTIFIED BY LAND RESTRICTIONS AND ECONOMIC CONSIDERATIONS.	
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854									
860	RAILROADS								

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG	IND.	
<p>This category group covers all two-rail tracks including spurs, sidings, yards, turnouts, with accessories and appurtenances such as barricades. It includes trackage on ship repair facilities, marine railways and portal crane structures.</p>									
86010	8601	LS	[MI]			RAILROAD TRACKAGE	N		RAIL TRACK TO INCLUDE SPURS, SIDINGS, YARDS, AND TURNOUTS. TRACK INCLUDES TWO PARALLEL RAILS, CROSSTIES, AND ROADBED.
86020	1495	S	[EA]			EXPLOSV BARICD,TRUCK/CAR	N		A CONCRETE AND EARTHEN STRUCTURE PLACED ALONGSIDE A SUSPECT CARGO SITE FOR TRUCKS AND RAILCARS CONTAINING AMMUNITION OR EXPLOSIVES THAT ARE SUSPECTED OF BEING IN A HAZARDOUS CONDITION.
86030	8611	S	[MI]	LF	RR	BRIDGE&TRESTLE	N		BRIDGES THAT SUPPORT RAILROAD TRACK CROSSING OF A RIVER, ROAD UNDERPASS, OR SIMILAR GAP.
86040	8601	LS	[MI]			CRANE TRACKAGE	N		TRACKAGE USED IN OPERATIONAL AREAS TO ALLOW CRANE TRAVEL BETWEEN OPERATIONAL FACILITIES OR WATERFRONT AREAS SUCH AS PIERS AND WHARVES.
86041	8923	S	[SF]	EA		RAILROAD SCALEHOUSE	N		A RAILROAD SCALEHOUSE IS A FACILITY DESIGNED TO WEIGH RAIL CARGO. TYPICALLY, TRACKS ARE LAID TO ALLOW RAILCARS TO BE PULLED THROUGH THE SCALEHOUSE.

861

870 GROUND IMPROVEMENT STRC

This category group includes drainage and storm sewer systems, bo

871 GROUNDS, DRAINAGE

Drainage and storm sewer systems including appurtenant dykes, dams, and retaining walls. For combined storm and sanitary sewer systems, use basic category codes 831 and 832.

87110	8321	LS	[LF]			STORM SEWER	N		STORM SEWERS ARE COMPONENTS OF A STORM DRAINAGE SYSTEM THAT COLLECTS THE SURFACE RUNOFF WATER AND CONVEYS IT TO OUTLET POINTS.
87111	8313	S	[KG]			OIL/WATER SEPARATOR-RUNOFF	N		OIL/WATER SEPARATOR USED FOR SEPARATING PETROLEUM CONTAMINANTS FROM STORMWATER PRIOR TO BEING REINTRODUCED INTO THE NATURAL ENVIRONMENT.



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
87115	8452	S	[EA]	KG		STORM WATER PUMPING STA	N	PUMP STATION FACILITY USED FOR MOVING STORMWATER RUNOFF FROM ONE ELEVATION/LOCATION TO ANOTHER.	
87116	8715	S		[MG]		STORM WATER POND	N	A STORM WATER RETENTION POND IS UTILIZED TO CONTAIN AND CONTROL STORM WATER RUNOFF AT A PREDETERMINED RATE.	
87120	8711	LS	[LF]			DRAIN DITCH,EXC ROAD DITCH	N	DRAINAGE DITCHES SERVE THE SAME PURPOSE AS STORM SEWERS. THEY ARE PREFERABLE TO COVERED STRUCTURES TO MINIMIZE CONSTRUCTION, TO CONSERVE MATERIALS, AND TO FACILITATE MAINTENANCE.	
87125	8714	S	[LF]	EA		DYKE / DAM	N	A DAM IS AN ARTIFICIAL OR NATURAL BARRIER USUALLY CONSTRUCTED ACROSS A STREAM CHANNEL TO IMPOUND WATER.	
87126	8714	S	LF	[EA]		LEVEE &/OR DIKE	N	A LEVEE IS A TYPE OF DAM THAT RUNS ALONG THE BANKS OF A RIVER OR CANAL. LEVEES REINFORCE THE BANKS AND HELP PREVENT FLOODING.	
87130	8451	LS		EA	[LF]	IRRIGATION FACILITY	N	THESE FACILITIES ARE USED TO SUPPLY WATER TO AREAS THAT NEED WATER ABOVE THE AMOUNT OF NATURAL RAINFALL. THEY CAN CONSIST OF A SERIES OF PUMPS, PIPES AND OTHER ASSOCIATED EQUIPMENT.	
87135	8712	S	[LF]			RETAINING WALL	N	A STRUCTURE CONSTRUCTED TO RESTRICT OR PREVENT THE HORIZONTAL MOVEMENT OF EARTH.	
87145	8714	S		EA	[LF]	DREDGED SPOIL HNDLG FAC	N	FACILITY FOR STORAGE OF DREDGE SPOILS PRIOR TO PROCESSING AND REMOVAL.	
872						FENCING/WALLS/GU ARD TOWERS			

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
This basic category provides boundary security in the form of fencing, walls, gates, watch towers, guard walks, and guard shelters. The type and amount of security planned is a function of the security classification required, and the economical utilization of security guards.									
87210	8721	LS		[LF]		SECURTY/PERIMTR FENCE/WALL	N		SECURITY FENCING AND WALLS DEFINE THE LIMITS OF SECURITY AREAS AND FACILITATE THE EFFECTIVE AND ECONOMICAL USE OF SECURITY PERSONNEL. FENCING IS PLANNED ON THE BASIS OF A STUDY OF THE SECURITY CLASSIFICATION REQUIREMENTS OF THE INSTALLATION.
87211	8722	LS		[LF]		HARDENED SEC FENCE	N		A LINEAR STRUCTURE INTENDED TO RESTRICT ACCESS TO A SPECIFIC AREA OR TO RESTRICT AND DIRECT THE FLOW OF TRAFFIC. THESE STRUCTURES INCLUDE HARDENING OR SPECIAL CHARACTERISTIC BEYOND STANDARD FENCES AND WALLS SUCH AS INTRUSION DETECTION, RAZOR WIRE, OR BARRIER IMPACT/PENETRATION RESISTANCE MEASURES.
87215	8721	LS		[LF]		INTERIOR FENCE*EXC 87210*	N		MISCELLANEOUS FENCING INTERIOR TO AN INSTALLATION PERIMETER FENCE. THIS CATEGORY CODE IS FOR INVENTORY PURPOSES ONLY.
87220	1734	S	SF	[EA]		GUARD AND WATCH TOWERS	N		WHERE AUTHORIZED, GUARD OR WATCHTOWERS SHOULD BE CONSTRUCTED AT LOCATIONS THAT WILL PROVIDE THE BEST OBSERVATION OF SECURITY AREAS.
87230	1458	S		[EA]		MECH SEC BARRICADE	N		MECHANICALLY OPERATED BARRICADE CONSISTING OF POP-UP BOLLARDS, RISING ROAD PLATES, OR WEDGES DESIGNED TO CONTROL VEHICLULAR OR OTHER TRAFFIC. UNIT OF MEASURE IS EA AND INCLUDES DEVICES USED FOR A SINGLE TRAFFIC LANE.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS		DESCRIPTION
			AREA	OTHER	ALT		RPTG IND.		
This basic category includes separate integral signal systems such as fire alarm, watch reporting, and security. Telephone reporting systems are planned with telephone systems (see Code 130).									
88010	1351	LS		[MI]		FIRE ALARM COMM LINES	N		THIS CATEGORY CODE IS USED TO CAPTURE THE FIRE ALARM REPORTING SYSTEM RELATED COMMUNICATION LINES THAT ARE EXTERIOR TO THE BUILDINGS THEY SERVE. FACILITY FIRE ALARM EQUIPMENT AND RELATED BUILDING INFRASTRUCTURE ARE EITHER RPIE OR PPE AND ARE NOT INCLUDED IN THIS CATEGORY CODE.
88020	1351	LS		[MI]		WATCH RPTG SYSTEM LINES	N		A WATCH REPORTING SYSTEM PROVIDES A METHOD FOR THE AUTOMATIC AND NON-AUTOMATIC DETECTION OF FIRE AND FOR SECURITY PROTECTION (INTRUSION DETECTION SYSTEM) THROUGHOUT DESIGNATED AREAS, BUILDINGS, AND STRUCTURES. THE WATCH REPORTING SYSTEM PROVIDES LOCAL ALARMS AND CENTRAL STATION ALARMS TO BUILDING OCCUPANTS AND TO STATION SECURITY AND FIREFIGHTING PERSONNEL.
88030	1351	LS		[MI]		BASE ALERT SYSTEMS LINES	N		BASE ALERT SYSTEMS SHALL BE PLANNED FOR ALL NAVY INSTALLATIONS. THE SYSTEM MAY ALERT BASE PERSONNEL TO AIR RAIDS, CHEMICAL/BIOLOGICAL ATTACKS OR ANY OTHER TYPE OF TERRORIST ATTACK. HORNS OF HIGH-POWER TYPE MAY BE USED AS SIGNAL DEVICES.
88040	1351	LS		[MI]		AIR CRASH/ALERT COMM LINES	N		ALARM SYSTEM INTENDED TO ALERT IN THE EVENT OF AN AIR CRASH
<hr/>									
881									
882									
883									
<hr/>									
890	MISCELLANEOUS UTILITIES								

## Category Code Report (All Series)

CATEGORY	FAC	RPA	UNITS			RQMTS	DESCRIPTION
CODE	CODE	TYPE	AREA	OTHER	ALT	RPTG	IND.

This Category Code is used for structures associated with public works utilities shops and other miscellaneous utility buildings. If a utility building cannot be classified under one of the other utility type buildings, this Category Code should be used.

89009	8910	B	[SF]			MISC UTILITY BLDG	N	THIS CATEGORY CODE IS USED FOR BUILDINGS ASSOCIATED WITH PUBLIC WORKS UTILITIES SHOPS AND OTHER MISCELLANEOUS UTILITY BUILDINGS. IF A UTILITY BUILDING CANNOT BE CLASSIFIED UNDER ONE OF THE OTHER UTILITY TYPE BUILDINGS, THIS CATEGORY CODE SHOULD BE USED.
89011	8930	LS	[LF]			ACETYLENE DISTRBTN SYSTEM	N	THE DISTRIBUTION SYSTEM FOR ACETYLENE GAS GENERATED BY THE ACETYLENE PLANT IN CCN 89010.
89015	8921	S	[EA]			NITROGEN PLANT	N	NITROGEN IS USED WHERE AN INERT GAS IS REQUIRED. A NITROGEN PLANT IS REQUIRED FOR THE PROVISION OF LARGE QUANTITIES OF NITROGEN FOR SPECIAL APPLICATIONS.
89018	8927	S	[EA]			UTILITY VAULT	N	A UTILITY VAULT IS AN ENCLOSED STRUCTURE GENERALLY MADE OF CONCRETE THAT CONTAINS UTILITY EQUIPMENT, CONNECTIONS AND/OR LINES. A UTILITY VAULT IS TYPICALLY AN UNDERGROUND STRUCTURE.
89020	8921	S	[EA]			COMPRESSED AIR PLANT	N	COMPRESSED AIR IS USED BY THE NAVY IN NUMEROUS APPLICATIONS, SUCH AS FOR PNEUMATIC TOOLS, LAUNDRY EQUIPMENT, INSTRUMENTATION AND CONTROL EQUIPMENT, AND IN HOSPITALS AND LABORATORIES.
89021	8930	LS	[LF]			COMPD AIR DISTRBTN SYSTEM	N	COMPRESSED AIR IS USED BY THE NAVY IN NUMEROUS APPLICATIONS, SUCH AS FOR PNEUMATIC TOOLS, LAUNDRY EQUIPMENT, INSTRUMENTATION AND CONTROL EQUIPMENT, AND IN HOSPITALS AND LABORATORIES.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS	DESCRIPTION
			AREA	OTHER	ALT		RPTG	
						IND.		
89025	8921	S		[EA]		CARBON DIOXIDE PLANT	N	A CARBON DIOXIDE PLANT AT A NAVAL ACTIVITY PROVIDES SPACE FOR THE STORAGE AND TRANSFER OF CARBON DIOXIDE. THE SPACE CONTAINS A STORAGE TANK AND A DISTRIBUTION SYSTEM USED FOR REFILLING CARBON DIOXIDE FIRE EXTINGUISHERS.
89027	7322	B	SF	[TR]		ICE-MAKING PLANT	N	FACILITY FOR THE CREATION AND DISTRIBUTION OF ICE.
89030	8921	S		[EA]		INDUSTRIAL OXYGEN PLANT	N	FACILITY USED TO GENERATE OXYGEN (NON-BREATHABLE) FOR INDUSTRIAL USE WHERE IT IS OTHERWISE UNAVAILABLE.
89031	8930	LS		[LF]		OXYGEN DISTRIBUTION SYSTEM	N	PUMPS, PIPES AND LINES ASSOCIATED WITH THE DISTRIBUTION OF INDUSTRIAL OXYGEN PRODUCED BY THE INDUSTRIAL OXYGEN PLANT IN CCN 89030.
89045	8910	B	[SF]			VALVE HSE,OTHER ENCLOSURE	N	THIS CATEGORY CODE IS USED FOR ANY ENCLOSURE USED FOR HOUSING VALVES OR OTHER UTILITY EQUIPMENT THAT IS NOT CONTAINED IN ANY OTHER CCN.
89046	8931	LS		[LF]		UTILITY TUNNEL	N	THIS CATEGORY CODE IS USED FOR A TUNNEL IN WHICH UTILITY SYSTEMS ARE ROUTED. THERE MAY BE MULTIPLE UTILITY SYSTEMS IN A SINGLE TUNNEL NETWORK.
89050	1351	LS		[MI]		ICS COMM LINES	N	This CCN applies to the communication links portion of an Industrial Control System (ICS). An ICS manages and moves data to provide real-time operational capability, real time consumption, demand management, energy reduction and maintenance savings opportunities, and increases the reliability and efficiency associated with building and utility systems at shore installations.
89051	8910	B	[SF]			ICS MON STA	Y	AN ICS MONITORING STATION IS USED TO MONITOR AND CONTROL MECHANICAL SYSTEMS OF FACILITIES AT REMOTE LOCATIONS.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
89056	8923	S	[EA]			WEIGHTING FACILITY	N	VEHICULAR SCALES TYPICALLY USED FOR WEIGHING TRANSPORT TRUCKS AND CONTAINERS AT AN INSTALLATION.	
89077	8910	B	[SF]			UTILITY SYSTEM STRG(MISC)	Y	THIS CATEGORY CODE IS USED FOR INVENTORY PURPOSES ONLY. USE CATEGORY CODE 890 09 FOR MISCELLANEOUS UTILITY BUILDINGS.	
<hr/>									
891									
892									
89210	1499	S	[EA]			MONITORING WELLS	N	WELLS INSTALLED AROUND A SITE IN ORDER TO DETECT THE DISCHARGE OF ANY LEACHATE. SAMPLES FROM THE WELLS SHOULD BE ANALYZED PRIOR TO THE DISPOSAL OF ANY WASTE IN ORDER TO ESTABLISH BASELINE DATA.	
<hr/>									
893	MISCELLANEOUS UTILITIES-LF								
89320	8932	LS	[LF]			UTILITY CHANNEL	N	A UTILITY CHANNEL IS AN ENCLOSED UNDERGROUND CHANNEL FOR UTILITY, COMMUNICATION OR OTHER LINES THAT BOTH PROTECTS THE LINES, AND PROVIDES RELATIVELY EASY ACCESS FOR THEIR MAINTENANCE.	
<hr/>									
895									
900	REAL ESTATE								
910	LAND - GOVERNMENT OWNED								
911	LAND PURCH,COND,DONA/ TRANS								
<p>This basic category includes lands acquired in fee purchase, condemnation, donation, exchange or transfer, which is owned in fee by the Federal Government, and under custody and accountability of the Department of the Navy.</p>									
91110	9110	L	[AC]			LAND - PURCHASE	N	LAND ACQUIRED IN FEE BY PURCHASE IS A NEGOTIATED SALE OF THE PROPERTY FROM PRIVATE OWNERS TO THE FEDERAL GOVERNMENT BY CONVEYANCE OF DEED.	
91120	9110	L	[AC]			LAND - DONATION	N	LAND ACQUIRED IN FEE BY DONATION USUALLY CONSISTS OF A CONVEYANCE OF FEE TITLE BY THE DONOR WITHOUT MONETARY CONSIDERATION.	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
91130	9110	L	[AC]			LAND - TRANSFER	N	TRANSFERS OF FEDERAL GOVERNMENT-OWNED LAND AMONG DEPARTMENTS AND AGENCIES OF THE FEDERAL GOVERNMENT	
91140	9110	L	[AC]			LAND - CONDEMNATION	N	LAND IS ACQUIRED BY CONDEMNATION WHERE LAND IS ESSENTIAL FOR A PROJECT WHICH AFFECTS NATIONAL DEFENSE OR SECURITY, AND THE CONSIDERATION FOR PURCHASE CANNOT BE MUTUALLY AGREED UPON BETWEEN THE OWNER AND THE NAVY.	
91150	9110	L	[AC]			LAND - EXCHANGE	N	LAND ACQUIRED BY EXCHANGE IS SIMILAR IN PRINCIPLE TO ACQUISITIONS BY PURCHASE EXCEPT THAT THE CONSIDERATION IS BY LAND VALUE RATHER THAN CASH.	
<hr/>									
912						LAND-PUB DOMAIN WITHDRAWAL			
<p>The Navy Department may acquire land by withdrawal from public domain under jurisdiction of the Department of the Interior. Withdrawals of less than 5,000 acres are made by Public Land Order. Withdrawal of more than 5,000 acres for any one project must be approved by Act of Congress. In addition to securing authorization from the Armed Services Committees of Congress, a bill must be introduced in the Committees on Public Land and Insular Affairs for acquisition of public domain lands in excess of 5,000 acres.</p>									
91210	9120	L	[AC]			LAND - PUB DOMAIN,PERM	N	FEDERAL GOVERNMENT LAND PERMANENTLY EXCLUDED FROM SOME OR ALL FORMS OF ENTRY, USE, SALE, OR OTHER DISPOSAL UNDER THE PUBLIC LANDS LAWS AS SPECIFIED IN THE PUBLIC LAND ORDER, EXECUTIVE ORDER, OR ACT OF CONGRESS AND THOSE LANDS THAT ARE RESERVED FOR A SPECIFIED DEPARTMENT OR AGENCY FOR A SPECIFIC PUBLIC PURPOSE.	
91215	9111	L	[AC]			LAND - SET ASIDE- HAWAII	N	FEDERAL GOVERNMENT LAND RESERVED THROUGH LAND TRUST IN STATE OF HAWAII	

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
91220	9120	L	[AC]			LAND-PUB DOMAIN,TEMPORY	N	FEDERAL GOVERNMENT LAND EXCLUDED FROM SOME OR ALL FORMS OF ENTRY, USE, SALE, OR OTHER DISPOSAL UNDER THE PUBLIC LANDS LAWS AS SPECIFIED IN THE PUBLIC LAND ORDER, EXECUTIVE ORDER, OR ACT OF CONGRESS AND THOSE LANDS THAT ARE RESERVED FOR A SPECIFIC PUBLIC PURPOSE FOR A SPECIFIED PERIOD OF TIME.	
913			LAND - LICENSE OR PERMIT			Land is acquired for temporary use under license or permit. The license or permit is a privilege, revocable at will, to use the property of the licensor, for a specified purpose and period of time. Land from Public Domain used under temporary permit is obtained under agreement between the Navy Department, and the Department of the Interior. The temporary permit implies no use detrimental to the land such as contamination.			
91310	9130	L	[AC]			LAND-TEMP USE,LIC,PMT,AGMT	N	THIS LAND IS ACQUIRED FOR TEMPORARY USE UNDER LICENSE OR PERMIT. THE LICENSE OR PERMIT IS A PRIVILEGE, REVOCABLE AT WILL, TO USE THE PROPERTY OF THE LICENSER, FOR A SPECIFIED PURPOSE AND PERIOD OF TIME.	
91320	9130	L	[AC]			LAND-PUB DOMAIN -TEMP/PMT	N	LAND FROM PUBLIC DOMAIN USED UNDER TEMPORARY PERMIT IS OBTAINED UNDER AGREEMENT BETWEEN THE NAVY DEPARTMENT, AND THE DEPARTMENT OF THE INTERIOR. THE TEMPORARY PERMIT IMPLIES NO USE DETRIMENTAL TO THE LAND SUCH AS CONTAMINATION.	
914			PUBLIC LAND- TERRIT & POSS			Land from U.S. possessions is acquired for temporary or long-term use by Executive Order or permit agreement for a limited specific use. This includes public land of U.S. possessions acquired and used under long-term agreements or temporary agreements, and public land of U.S. possessions assigned to the Navy on temporary permit.			
91410	9140	L	[AC]			LAND-PUBLIC- TEMPO/LNG TERM	N	THIS CODE IS USED FOR PUBLIC LAND OF U.S. POSSESSIONS ACQUIRED AND USED UNDER LONG-TERM AGREEMENTS OR TEMPORARY AGREEMENTS.	



## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
91420	9140	L	[AC]			LAND-PUBLIC-TEMP PERMIT	N		THIS CODE IS USED TO DESIGNATE PUBLIC LAND OF U.S. POSSESSIONS ASSIGNED TO THE NAVY ON TEMPORARY PERMIT.
920						LAND - OTHER RIGHTS			
921						LAND - EASEMENT			
<p>An easement is a conveyance of interest in real property for particular purposes and needs of the Navy. An easement is acquired by deed for a term of years or in perpetuity. The grantor of an easement may continue to use the land within the stipulations of the easement.</p>									
92110	9210	L	[AC]			LND-AVTN EASEMENT- PURCHASE	N		AN AVIATION EASEMENT IS PURCHASED TO CONVEY CERTAIN PROPERTY RIGHTS FROM THE PRIVATE OWNER TO THE FEDERAL GOVERNMENT. THIS IS DONE BY CONVEYANCE OF DEED. EASEMENTS ARE ACQUIRED TO INSURE FREE AND UNOBSTRUCTED AIRCRAFT PASSAGE THROUGH THE AIRSPACE. THE EASEMENT PROVIDES THE RIGHT TO LIMIT STRUCTURE HEIGHT AND NATURAL GROWTH.
92120	9210	L	[AC]			LND-AVTN EASEMT- CONDEMN	N		THIS CODE VARIES FROM 921 10 ONLY IN THE METHOD OF ACQUISITION. POSSESSION IS OBTAINED BY CONDEMNATION ONLY WHEN THE PURCHASE PRICE CANNOT BE MUTUALLY AGREED UPON BETWEEN THE OWNER AND THE NAVY.
92130	9210	L	[AC]			LAND-OTH EASEMENT- PURCHASE	N		EASEMENTS OTHER THAN FOR NAVIGATION ARE ACQUIRED BY NEGOTIATED SALE. THESE EASEMENTS PROVIDE RIGHTS-OF-WAY FOR TYPICAL UTILITY LINES AND ACCESS ROADS AS WELL AS MANY OTHER PURPOSES, INCLUDING RESTRICTIONS ON USE.
92140	9210	L	[AC]			LAND-OTH EASEMENT- CONDEMNNA	N		THIS IS SIMILAR TO 921 30 BUT DIFFERS IN THAT AGREEMENT ON A NEGOTIATED EASEMENT CANNOT BE REACHED, AND THE EASEMENT IS OBTAINED BY CONDEMNATION FOR REASON OF NATIONAL DEFENSE OR SECURITY.

## Category Code Report (All Series)

CATEGORY CODE	FAC CODE	RPA TYPE	UNITS OF MEASURE			TITLE	RQMTS RPTG		DESCRIPTION
			AREA	OTHER	ALT		IND.		
92150	9210	L	[AC]			LAND-OTH EASEMENT- EXCHANGE	N		THIS IS SIMILAR TO 92130 BUT DIFFERS IN THAT CONSIDERATION IS LAND VALUE RATHER THAN CASH.
922						LAND - IN-LEASE			
An in-lease is a conveyance of a possessory interest in real property for a term of years for rent or other consideration. Leased property is categorized under three groups as follows: Land is leased from private owners for periods under 25 years, land is leased from State and local governments for periods under 25 years, and Land in-lease for 25 years or more is categorized as "long-term". The land may be leased from private enterprise, or State or local governments.									
92210	9220	L	[AC]			LAND-IN-LEASE- PRIV ENTERPR	N		THIS LAND IS LEASED FROM PRIVATE OWNERS FOR PERIODS UNDER 25 YEARS.
92220	9220	L	[AC]			LAND- IN-LEASE- STAT&LOC	N		THIS LAND IS LEASED FROM STATE AND LOCAL GOVERNMENTS FOR PERIODS UNDER 25 YEARS.
92230	9220	L	[AC]			LAND-IN LEASE- LONG TERM	N		LAND IN-LEASE FOR 25 YEARS OR MORE IS CATEGORIZED AS "LONG-TERM". THE LAND MAY BE LEASED FROM PRIVATE ENTERPRISE, OR STATE OR LOCAL GOVERNMENTS.
923						LAND - FOREIGN RIGHTS			
Land under custody and accountability of the Navy Department comprising a Navy installation in a foreign country except land under easement, Code 921. The method of acquisition or use of real property in a foreign country depends upon, and is accomplished by, diplomatic agreement and subsidiary military agreements or, where applicable, by lease or other agreement. Fee simple title to real property in a foreign country is not acquired. The extent of interest which may be acquired in such property depends upon the agreement. Acquisition or use of real property in an occupied country is accomplished by requisition or other local arrangements.									
92310	9230	L	[AC]			LAND-FOREIGN 99 YR LEASE	N		LAND - FOREIGN, 99-YEAR LEASE
92320	9230	L	[AC]			LAND-FOREIGN, BASE RIGHTS	N		LAND - FOREIGN, BASE RIGHTS
92330	9230	L	[AC]			LAND-FOREIGN	N		LAND - FOREIGN, RECIPROCAL AID RECIP AID
92340	9230	L	[AC]			LAND - FOREIGN, OCC AREA	N		LAND - FOREIGN, OCCUPIED AREA
92350	9230	L	[AC]			LAND-FOREIGN, IN-LEASE	N		LAND - FOREIGN, IN-LEASE
92360	9230	L	[AC]			LAND- FOREIGN,MISC	N		LAND - FOREIGN, MISCELLANEOUS

## Category Code Report (All Series)

CATEGORY	FAC	RPA	UNITS			RQMTS		
CODE	CODE	TYPE	AREA	OTHER	ALT	RPTG	IND.	DESCRIPTION
930								IMPROVEMENTS
931								BUILDINGS
<p>This code is to be used for budgeting purposes and for reporting buildings on land at the time land is acquired. Such facilities are carried under this code for the balance of the fiscal year when such land or buildings are acquired, then inventoried as appropriate in the 100 through 800 series of Category Codes.</p>								
932								SITE IMPROVEMENT
<p>Site improvements which are not associated with a specific building or structure within its own category code such as clearing, grading, landscaping, erosion control, and similar.</p>								
933								DEMOLITION
<p>This group is for demolition of buildings, structures, or utilities and removal of debris performed primarily to make usable or disposable an otherwise unusable site. Demolition directly related to a construction project is assigned the same code as for the project.</p>								
939								OTHER SITE IMPROVEMENTS

## Units Of Measure And Their Symbols

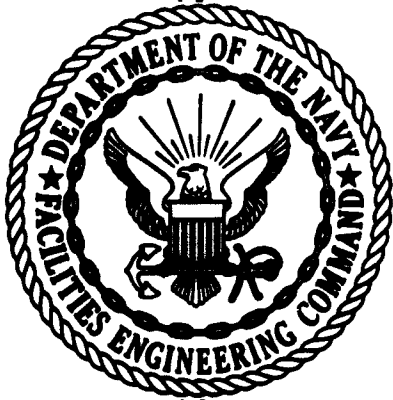
AC	ACRES	BD	HOSPITAL BEDS, NORMAL CAPACITY
BH	BTU PER HOUR	BL	BARRELS (42 GALS EACH)
BX	BOXES	CF	CUBIC FEET
CM	CUBIC FEET/MINUTE	CP	CANDLE POWER
CY	CUBIC YARDS	DS	DEPTH OF WATER OVERSILL @ HIGH TIDE
DW	DEPTH OF WATER OVERSILL @ LOW TIDE	EA	EACH
FA	FAMILY UNITS (HOUSING)	FB	LINEAR FEET OF BERTHING
FP	FIRING POINT (FIRING RANGES)	GA	GALLONS
GM	GALLONS PER MINUTE	HO	HOLES (GOLF COURSE)
IN	INCHES	KG	THOUSANDS OF GALLONS PER DAY
KV	KILOVOLT AMPERES	KW	KILOWATTS
LA	LANES (BOWLING)	LC	LIGHT CARE, HOSPITAL SPACE
LF	LINEAR FEET	LN	SET OF FIRING POINTS
MB	MILLIONS OF BTU PER HOUR	ME	METERS
MG	MILLIONS OF GALLONS	MI	STATUTE MILES
MW	MEGAWATTS	NF	NET SQUARE FEET (HOUSING)
NS	NET SQUARE FEET (STORAGE)	OL	OUTLETS, NUMBER OF
OU	OPERATING UNITS	PH	POUNDS PER HOUR
PN	PERSONS, DESIGN CAPACITY	SE	SEATS, NUMBER OF
SF	SQUARE FEET	SH	STACKING HEIGHT
SI	SITES	SP	STARTING POINT
SY	SQUARE YARDS	TC	TOTAL CUBIC FEET
TH	TONS PER HOUR	TN	TONS
TR	TONS, REFRIGERATION	VE	NUMBER OF VEHICLES

## UNIT OF MEASURE CODES &amp; DESCRIPTIONS

Unit of Measure Code	Description
AC	ACRES
BD	HOSPITAL BEDS, NORMAL CAPACITY
BL	BARRELS (42 GALS EACH)
BX	BOXES
CF	CUBIC FEET
CM	CUBIC FEET/MINUTE
CP	CANDLE POWER
CY	CUBIC YARDS
DS	DEPTH OF WATER OVERSILL @ HIGH TIDE
DW	DEPTH OF WATER OVERSILL @ LOW TIDE
EA	EACH
FA	FAMILY UNITS (HOUSING)
FB	LINEAR FEET OF BERTHING
FP	FIRING POINT (FIRING RANGES)
GA	GALLONS
GM	GALLONS PER MINUTE
HO	HOLES (GOLF COURSE)
IN	INCHES
KG	THOUSANDS OF GALLONS PER DAY
KV	KILOVOLT AMPERES
KW	KILOWATTS
LA	LANES (BOWLING)
LC	LIGHT CARE, HOSPITAL SPACE
LF	LINEAR FEET
LN	SET OF FIRING POINTS
MB	MILLIONS OF BTU PER HOUR
ME	METERS
MG	MILLIONS OF GALLONS
MI	STATUTE MILES
MW	MEGAWATTS
NF	NET SQUARE FEET (HOUSING)
NS	NET SQUARE FEET (STORAGE)
OL	OUTLETS, NUMBER OF
OU	OPERATING UNITS
PH	POUNDS PER HOUR
PN	PERSONS, DESIGN CAPACITY
SE	SEATS, NUMBER OF
SF	SQUARE FEET
SH	STACKING HEIGHT
SI	SITES
SP	STARTING POINT
SY	SQUARE YARDS
TC	TOTAL CUBIC FEET
TH	TONS PER HOUR
TN	TONS
TR	TONS, REFRIGERATION
VE	NUMBER OF VEHICLES

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# **FACILITY PLANNING FACTORS FOR NAVAL SHORE ACTIVITIES**

## **Appendix C Runway Capacity Handbook-Fixed Wing**

**NAVFAC P-80.1  
JUNE 1972**

**DEPARTMENT OF THE NAVY  
NAVAL FACILITIES ENGINEERING COMMAND  
WASHINGTON, D. C. 20390**

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FOREWORD

This appendix to NAVFAC P-80 provides planning procedures to determine and evaluate practical hourly and daily capacity of various runway/taxiway configurations at Naval and Marine Corps Air Installations supporting fixed wing aircraft. The procedures developed herein are not applicable to helicopter or joint use (Navy-Marine Corps/Civilian) installations.

Procedures, examples and worksheets are provided for the computation of capacities for Instrument Flight Rules (IFR), Visual Flight Rules (VFR) and Carrier Practice Landings (CPL).

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Note: Figures and Tables used in Section III (EXAMPLES) are not listed above.

## Section I. INTRODUCTION

This Appendix describes the procedures necessary to compute the hourly and daily aircraft handling capacity of an air station's runway system. The following basic factors are considered in the process:

- . Type of aircraft (Not including Helicopters)
- . Type of operations performed
- . Runway/taxiway design
- . Use of runways
- . IFR Capability

This procedure does not consider such items as personnel support, fueling requirements, ramp/gate/apron size, civilian landing OPS at joint use installations (will require special studies), etc. These factors could be a limiting constraint on an air station's ability to accommodate a specific aircraft demand and would have to be considered in an overall station capacity evaluation.

It should be recognized that there is a range of capacity values for any given station depending on the number of individual or combinations of runways that can be used. Runway use at any one time is related to the runway layout as well as operational factors including wind direction and velocity (crosswind and tailwind limitations), prevailing visibility and ceiling (VFR and IFR conditions), available runway lengths, location of

arresting gear, position of navigational facilities, environmental considerations (noise abatement procedures) and applicable air traffic control rules and regulations.

Typical air station runway layouts showing possible runway uses (operating configurations) are included on Figure 1-1. The selection of all possible operating configurations is necessary to calculate the range of capacities associated with a station. However, the selection of the primary operating configuration may be sufficient for study purposes in some cases.

Throughout the capacity procedures, reference is made to aircraft class (I, II, and III). These classes have been developed for capacity calculation purposes. A description of the classes and aircraft type they represent are shown on Table 1-1.

Capacity procedures are separately described for three types of operations; namely,

- . Under VFR conditions
- . Under IFR conditions
- . Carrier Practice Landing (CPL) procedures

As applicable, these procedures should be followed for each individual runway operating configuration for which capacity is required.

In order to calculate capacity, a forecast of aircraft activity has to be developed. Where an existing station with its current activity is being analyzed, a field survey can be used to develop forecast data. Where aircraft traffic changes are contemplated for an existing station or a new station is being planned for, other forecast techniques will have to be employed. For each analysis the forecast activity should be grouped into the three aircraft classes shown on Table 1-1. A further breakdown may then be required with respect to number of aircraft landing, taking off, performing touch and go's, taking off in pairs (side by side; not formations of two aircraft), and/or operating in formations of two, three or four. It should be noted that the forecast activity breakdown may differ significantly between VFR, IFR and CPL operating conditions.

Helicopter operations are not treated in these capacity procedures. At installations which support both helicopter and fixed wing aircraft on the same runway, consideration shall be given to providing a separate helicopter landing area before any evaluation is made as to the need for an additional fixed wing runway.

Figure 1-1  
**TYPICAL RUNWAY LAYOUTS AND OPERATING CONFIGURATIONS**

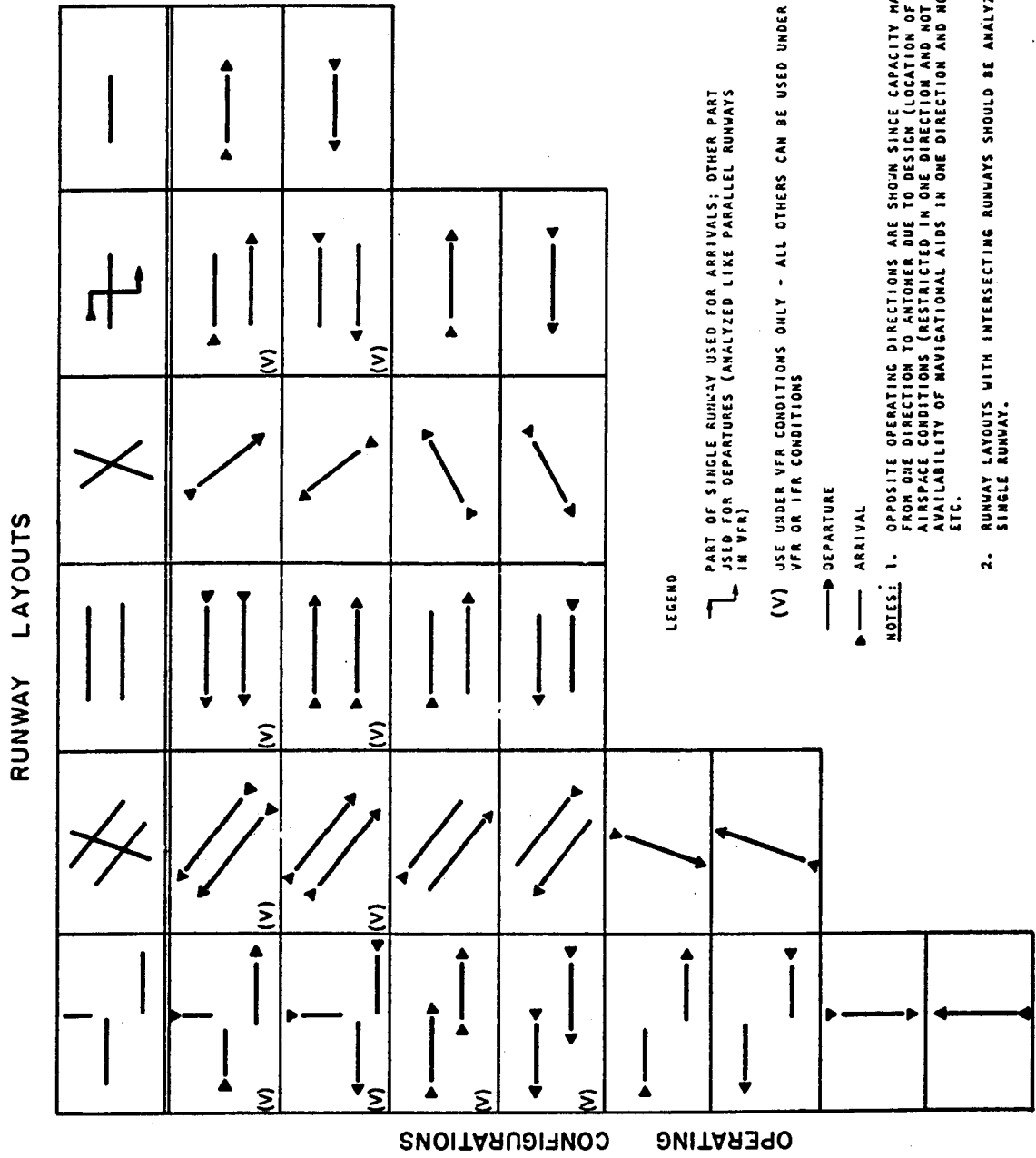




Table 1-1

U. S. NAVY AIRCRAFT CLASSES  
FOR CAPACITY CALCULATIONS

<u>Class</u>	<u>Description</u>	<u>Final Approach Speed (Knots)</u>	<u>Type</u>
I	Jet Aircraft	100-150	A4, A6, A7, F4, F8, T-1, T-2, T-33, F9, F-10, T-39, C-141, A-3, A-5, A-2
II	Turbo-Prop and Piston Aircraft	100-150	C-54, C-118, T-29, C-130, C-121, P-2, P-3, C-119, C-131
III	Turbo-Prop and Piston Aircraft	Less than 100	C-47, C-117, C-45, T-28, T-34, U11A, OV-10, S-2, C-1, E-1, U-6

## Section II. CAPACITY PROCEDURES

This section describes the procedures necessary to calculate VFR, IFR, Carrier Landing Practice and Daily Capacities.

1. DEFINITIONS. Before proceeding, the following definitions should be reviewed:

- a. Hourly Arrival Capacity (HAC): the hourly aircraft movement rate which can be sustained at a reasonable average delay imposed on aircraft using a runway for arrivals only.
- b. Hourly Departure Capacity (HDC): the hourly aircraft movement rate which can be sustained at a reasonable average delay imposed on aircraft using a runway for departures only.
- c. Hourly Mixed Capacity (HMC): the hourly aircraft movement rate which can be sustained at a reasonable average delay imposed on aircraft using a runway for arrivals and departures at the same time.
- d. Hourly Total Capacity (HTC): the summation of all available hourly capacities. In the case of a single runway used for arrivals and departures at the same time,  $HTC = HMC$ ; where multiple runways are used for arrivals (only) and departures (only),  $HTC =$  the sum of HAC and HDC.
- e. Daily Capacity: number of aircraft that can be accommodated on a daily basis on an air station's runway system.

only necessary to forecast the extent to which any of these operations are likely or planned to occur, during any period of interest such as an hour, two hours, half day, etc., in order to determine a runway capacity appropriate for the intended use. VFR Runway Capacity Analysis Work Sheets with provisions for logging the forecast of aircraft activity and calculations of HDC, HAC and HMC are presented on Tables 2-3, 2-4 and 2-5 respectively. Instructions for application of these Tables follow later in this Section.

- b. Aircraft Takeoff Considerations. A runway used exclusively for takeoff will have a capacity dependent on the class of aircraft using the runway, and on the extent to which takeoffs are conducted singly, in formations or paired. When aircraft of a given class are operated singly, an average hourly departure capacity (HDC) can be established which is typical for VFR operations of the class from most any runway. This movement rate is largely controlled by average speed and the separation required for aircraft of the particular class and are noted below:

HDC - Hourly Departure Capacity-Movements Per Hour

<u>Class of Aircraft</u>	<u>HDC</u>
I	49
II	63
III	90

If some of the takeoffs are conducted in formations or in pairs (side-by-side), then the number of aircraft which can be accommodated in a given time is increased.

2. VFR RUNWAY CAPACITY ANALYSIS. This paragraph describes the procedures to determine hourly capacity of a runway used for normal air station operations in VFR conditions. For procedures to determine the capacity of the same runway in IFR conditions, or when it is used for CLP - see paragraphs 3 or 4 respectively.

These procedures should be repeated for each runway for which a capacity determination is required. A single analysis may be applicable to both directions of a runway if the operations are forecast to be identical, and the runway is symmetrical in terms of effective landing length and turnoffs available, for either landing direction.

- a. Forecast of Aircraft Activity. The capacity of a runway for accommodating aircraft operations depends significantly on how the runway is used, specifically in consideration of the following:
  - (1) The degree of mixing of various aircraft classes.
  - (2) Whether it is used for takeoffs only, landings only, or the degree to which they are mixed on a single runway.
  - (3) The type of takeoff operations, namely, made singly, in formations, or paired (side by side).
  - (4) The type of landing operations, namely, singly, in formations, performing touch-and-go's, or at reduced separation.

These procedures allow for accountability of these variables normally encountered in air station operations. In application of the procedures to a given runway it is then

Stated another way, the time required to handle each aircraft in formation, or paired, is less than the equivalent of one movement when aircraft takeoff singly.

The runway capacity analyses uses procedures which consider the effect of formations and paired takeoffs by converting this activity to "equivalent" single aircraft movements, i.e. two aircraft taking off paired equal one equivalent movement (equivalent movement factor equals 0.50); ten Class I aircraft taking off in formations of two equals six equivalent movements (equivalent movement factor equals 0.60). A breakdown of takeoff equivalent movement factors are listed below:

TAKEOFF EQUIVALENT MOVEMENT FACTOR

<u>Type of Takeoff</u>	<u>Class of Aircraft</u>		
	<u>I</u>	<u>II</u>	<u>III</u>
Single	1.00	1.00	1.00
Formation of 2	.60	.63	.69
Formation of 3	.47	.51	.59
Formation of 4	.41	.45	.54
Pairs	.50	.50	.50

The takeoff factors appropriate for the various classes of aircraft and number of aircraft in each formation are also shown on the appropriate Analysis Work Sheets.

When more than one class of aircraft is using the same runway, the hourly departure capacity (HDC) will be influenced by the relative amount each class of aircraft contributes to the total operations during the period under consideration. The Work Sheets describe the steps necessary to properly account for the mix

of aircraft by class. A weighted HDC is computed for each class and totaled for the mix of operations forecast for the runway analysis.

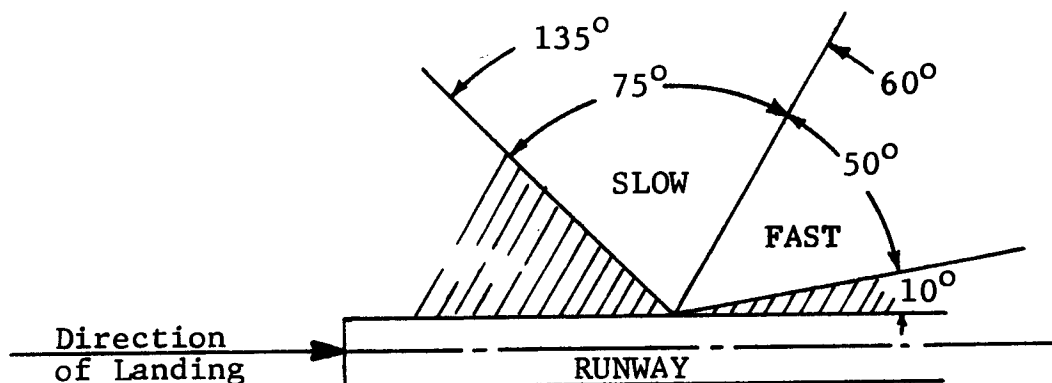
- c. Runway Rating. A runway used for landing, either exclusively or mixed with takeoff operations, will have a capacity influenced by the length of time that landing aircraft occupy the runway. Subsequent arriving or departing aircraft must wait until a landing aircraft has cleared the runway at an exit (or is a sufficient distance along the runway if reduced runway separation criteria are in use).

Average runway occupancy time (Runway Rating) will be influenced by landing speed (Class of Aircraft), field elevation, length of runway and by the number, type and location of turnoffs (exits) available along the runway.

Turnoffs which will contribute most to a favorable Runway Rating are those which are located along the runway close to the point where landing aircraft will have slowed to a safe turnoff speed in a normal deceleration. Turnoffs too close to the threshold will not be usable for fast aircraft. Turnoffs far down the runway will require a time consuming rollout. The contribution of each turnoff may thus vary depending on the speed class of aircraft using the runway.

The type of turnoff will also influence Runway Rating. A low angled turnoff in the direction of landing may normally be used at higher speed than one requiring

close to a 90° turn. For purposes of determining Runway Rating, the types of usable turnoffs will be classified as follows:



Note: Shaded areas outside usable turnoff range.

The usability of each available runway exit should be considered when determining the number of equivalent usable turnoffs which contribute to the Runway Rating. For example, one class of aircraft destined for a parking area on one side of the runway cannot reasonably use a turnoff leading to the opposite side, and some turnoffs may lead to conflict with takeoffs or other ground traffic.

A chart for use in determining Runway Rating for each aircraft class is provided on Figure 2-1. Examples illustrating use of the Runway Rating chart are included in Section III of this Handbook. When using the chart the following considerations should be kept in mind.

Usable turnoffs are in terms of equivalent "slow" turnoffs. A "fast" turnoff within the "Range of Usable Turnoffs" should be counted as two "slow" turnoffs.

- . Turnoffs which are located outside the "Range of Usable Turnoffs" on the chart should not be used in determining Runway Ratings.
- . "Fast" turnoffs which are located outside the "fast" range but are in the "slow" range on the chart should be counted as equivalent to only one "slow" turnoff.
- . When no usable turnoffs exist except at the end of the runway use the "End Only" line on the chart.
- . If only one turnoff exists (before the end of the runway) and it is located beyond the "Range of Usable Turnoffs" on the chart, use the "0" line to determine Runway Rating.

When "Reduced Separation" is authorized for any class of aircraft, the average time interval between landings will no longer be controlled by Runway Rating. An effective Runway Rating of 25 seconds is used for all operations of aircraft using "Reduced Separation".

- d. Aircraft Landing Considerations. A runway used exclusively for landing will have a capacity dependent on the class of aircraft using the runway, and the extent to which landings are conducted singly, in formations or as touch-and-go's. When aircraft of a given class are operated singly, an average hourly arrival capacity (HAC) can be established for each Runway Rating, which is typical for VFR operations of the class onto most any runway with the same rating. Intermittent low approaches are considered as touch-and-go's. HAC values for each class of aircraft for a range of Runway Ratings are presented in Table 2-1.



Similar considerations as those used for takeoff are included in the runway capacity analysis procedure. Landings in formation and touch-and-go's are converted to "equivalent" single aircraft movements. The "equivalent movement factors" to be used for the conversion of aircraft landings to equivalent movements will vary with HAC, since a formation interval or touch-and-go, takes the same amount of time regardless of aircraft class or Runway Rating.

The landing equivalent movement factors appropriate for the various classes of aircraft and number of aircraft in each formation are presented on Table 2-2.

When more than one class of aircraft is using the same runway, the total hourly arrival capacity (HAC) will be influenced by the relative amount each class of aircraft contributes to the total operations during the period under consideration. To properly account for the mix of aircraft by class, the Work Sheet include the steps necessary to compute weighted HAC.

- e. Mixed Takeoff and Landing Considerations. Runways used for mixed takeoffs and landings will have an average hourly mixed capacity (HMC) dependent on the mix of aircraft by class and on the mix of operations between takeoffs and landings. Aircraft types are designated by class depending on their typical terminal area operating speeds. When more than one class of aircraft is using a runway, a fast aircraft may follow a slow one, and vice versa, in landing or takeoff. The efficiency with which runways and airspace can be used decreases when speed classes are mixed.

When takeoffs and landings are mixed, the runway capacity will vary depending on the percent of total operations, during the period under consideration, which are reserved for landings, considering that landing operations will most always be given priority. A typical runway may display variations in HMC as the percent of landings changes as shown in the following example:

<u>% Landings</u>	<u>HMC</u>
0%	49 (HDC)
25	42
50	43
75	39
100	32 (HAC)

To properly account for the mix of aircraft by class and the mix of operations by percent of landings, the Work Sheet includes the steps necessary to compute the equivalent takeoff and landing movements by class, and the percent of equivalent movements which are landing.

A chart showing the relationship of Runway Rating, mix of aircraft classes, and percent landings, is presented on Figure 2-2. This chart is used in conjunction with the procedures outlined on the Work Sheet to determine HMC for the appropriate aircraft and operating mix.

- f. Aircraft Capacity. The values of HDC - hourly departure capacity; HAC - hourly arrival capacity, and HMC - hourly mixed capacity, determined by these procedures, calculates the number of equivalent single aircraft movements which could take place on the runway being analyzed considering the factors described above

under "Forecast of Aircraft Activity"; these capacities are identified on the Work Sheets with a subscript "E", for example,  $(HAC)_E$ . The procedures also then allow for conversion of the "equivalent" capacities into a value representative of the actual number of aircraft involved, that is, a pair equals two aircraft and a formation of 2, 3 and 4, equals 2, 3 and 4 aircraft; the actual capacity is identified on the Work Sheet with a subscript "A", for example,  $(HAC)_A$ . It is noted that throughout these procedures, touch-and-go traffic are considered arrivals only and are not counted twice (an arrival and takeoff) as is the normal control tower traffic counting procedures. Therefore the forecast of touch-and-go traffic must count such operations as arrivals only.

g. Use of Capacity Analysis Work Sheets. As applicable, the following three work sheets are to be used for the calculation of hourly capacity:

- (1) Table 2-3: "VFR Hourly Departure Capacity (HDC) Analysis Work Sheet" - used to calculate the capacity of a runway used for departures only.
- (2) Table 2-4: "VFR Hourly Arrival Capacity (HAC) Analysis Work Sheet" - used to calculate the capacity of a runway used for arrivals only.
- (3) Table 2-5: "VFR Hourly Mixed Capacity (HMC) Analysis Work Sheet" - used to calculate the capacity of a runway used for arrivals and departures (at the same time).

Each Work Sheet provides step by step procedures requiring either simple arithmetic computations or use of specified tables or charts. The following items regarding use of these tables are noted:

- (1) Most steps require use of previously computed values (from prior steps) and the "procedure" identifies the applicable steps and process.
- (2) Where "boxes" are shown below each step adjacent to sub-total and grand total lines, the appropriate addition of values should be made and entered; subsequent steps require use of sub-total and grand total values and are denoted in the procedures with subscripts "S" and "G" respectively.
- (3) Some values are constants and have therefore been pre-printed on the Work Sheets.

3. IFR CAPACITY PROCEDURES. Determination of an air station's IFR capability is dependent primarily upon the availability of radar ATC services. Such services may be provided by D.O.D. or F.A.A. ATC facilities or a combination of military and civil units in a joint operation. In joint facilities the F.A.A. normally is responsible for the radar approach control function while the military operates the Precision Approach Radar (PAR) positions of Ground Controlled Approach (GCA) facilities.

At those airfields not provided with their own radar facilities, surveillance radar service for departures and arrivals may be provided by adjacent F.A.A. or D.O.D. terminal radar air traffic control units or by the enroute Air Route Traffic Control Center (ARTCC) of the area.

Stations without terminal radar services may operate IFR with conventional air traffic control service provided by the ARTCC or by the NAS control tower.

- a. The following variables must be determined to compute IFR capacity:
- . Forecast of Activity in terms of Aircraft Class (I, II, III); if more than one class is involved, capacity is computed by weighting individual class capacity by percent distribution of each class.
  - . Availability of radar service
  - . Type Approach Aid: PAR (single or multiple); Conventional (VOR, TACAN, NDB).
  - . Airspace Limitations:  
Restrictive - single departure path  
Unrestrictive - more than one departure path

- . Runway Operating Configuration: (single, multiple dependent or multiple independent runways)
  
- b. Tables 2-6 and 2-7 respectively are to be used to compute IFR capacity of a single or parallel runway configurations. Application of these tables is illustrated through use of examples contained in Section III of this Handbook.

The capacity of a runway used exclusively for low approaches is computed using Table 2-7 for "unrestricted airspace" and "independent runway" conditions at a Ratio = 4.0.

4. CARRIER PRACTICE LANDING CAPACITY PROCEDURES. The capacity of Carrier Practice Landing activities on a runway whether performed at an outlying field or on a runway set-aside for that purpose at a conventional station, has been established at a standard 80 approaches per hour. This value is based on:

- . normal rectangular practice pattern
- . four aircraft within pattern

Increasing number of aircraft in pattern will not materially increase capacity.

Therefore HTC = 80 arrivals per hour; 160 total movements by count.

5. DAILY CAPACITY ANALYSIS. This paragraph describes the procedures to determine total daily capacity of an air station. The procedure derives the total number of aircraft which can be accommodated within a specified operating period (such as a day or part of a day), for the runway configurations forecast to be available, and for the mix of aircraft and types of aircraft movements forecast to be operated during the period.

The procedure requires that the following data be developed for each daily capacity analysis:

- . Choice of runway configurations which will be available during the period for operational use, considering forecast wind direction, wind velocity, ceiling and visibility.
  - . The number of hours of the day when each runway configuration will be used, considering daylight hours, weather forecasts and other operational factors bearing on choice and availability of runways.
  - . The hourly capacities for each runway operating configuration forecast to be used during the period of the analysis. The hourly runway capacity should be determined in accordance with Paragraphs 2 (VFR), 3 (IFR), or 4 (CPL) as appropriate for the forecast operating conditions.
- a. For a single runway airport, or for the periods of time at any airport when a runway is used for both arrivals and departures, the runway capacity will be the mixed capacity of the runway, in aircraft per hour, multiplied by the number of hours the particular runway is usable. If during the day a change of operating condition is to be considered, such as a period of IFR operation, or a different runway is used, the new mixed capacity for this

runway configuration multiplied by the hours it is usable, will give the partial day capacity for this condition. The total daily capacity will then be the sum of the capacities of all the single runway operating configurations usable.

- b. For multiple runway operations when two runways are used simultaneously, one for takeoff and one for landing, the total hourly capacity is the sum of the separate capacities of the two runways. However, the total hourly capacity of such a two runway operating configuration may not be representative of the number of aircraft that can be accommodated over a longer term (daily or partial day). This will be true whenever the forecast mix of takeoff and landing operations does not match the relationship of the takeoff to landing capacity of the two runways. For example: two runways, one with HAC=40 and the other with HDC=60 will have a total hourly capacity of 100; however, an aircraft activity forecast of 200 movements with 50% landings will not be accommodated in two hours since only 40 landings per hour will take place. The effective capacity of the two runways is only 80 movements per hour, limited by HAC=40. In this case since the ratio\* of arrivals to departures equals 1.00 (as indicated by "50% of landings"), the total capacity is twice the limiting (lowest value).

$$* \text{ Ratio} = \frac{\text{Arrivals}}{\text{Departures}}$$



However, where ratios other than 1.00 are involved, it is necessary to compute hourly total capacity as follows:

$$\text{Hourly Total Capacity} = \frac{\text{HAC} \times (1 + \text{Ratio})}{\text{Ratio}}$$

"or"

$$\text{HDC} \times (1 + \text{Ratio}),$$

whichever is less - application of this procedure is demonstrated through use of examples in Section III of this Handbook.

It is noted that in the calculation of Ratio, touch and go operations are considered as arrivals only. For example, given a traffic demand of 200 aircraft performing touch and go's, 300 "full-stop" arrivals and 250 departures, the

$$\text{Ratio} = \frac{200 + 300}{250} = \frac{500}{250} = 2.0$$

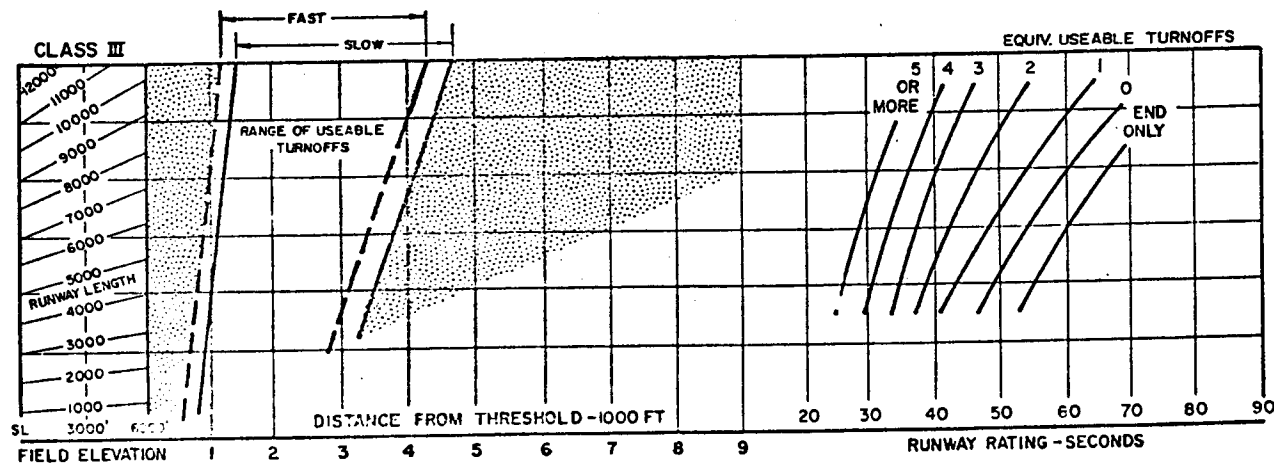
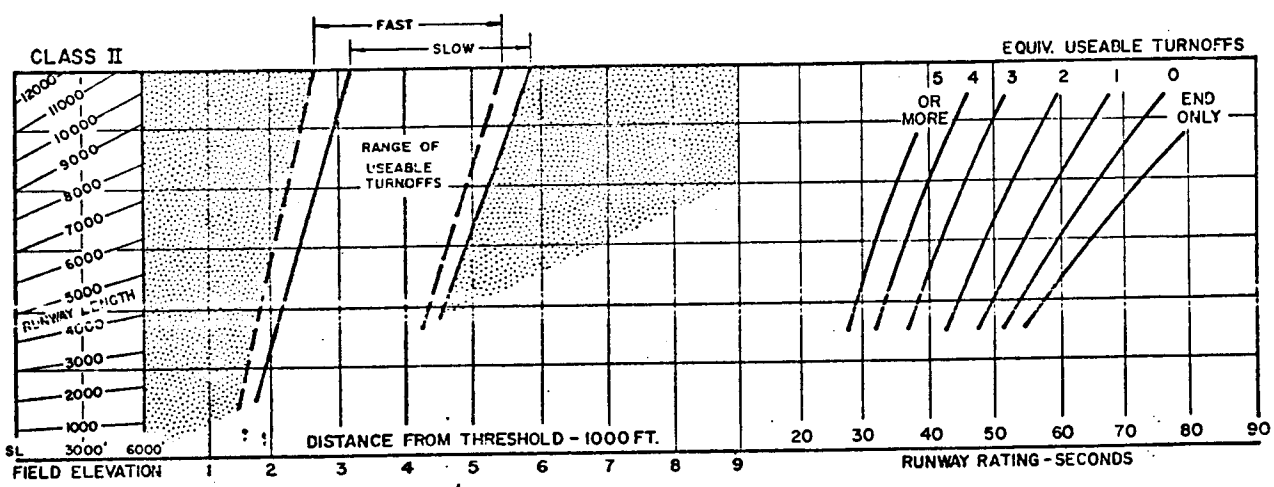
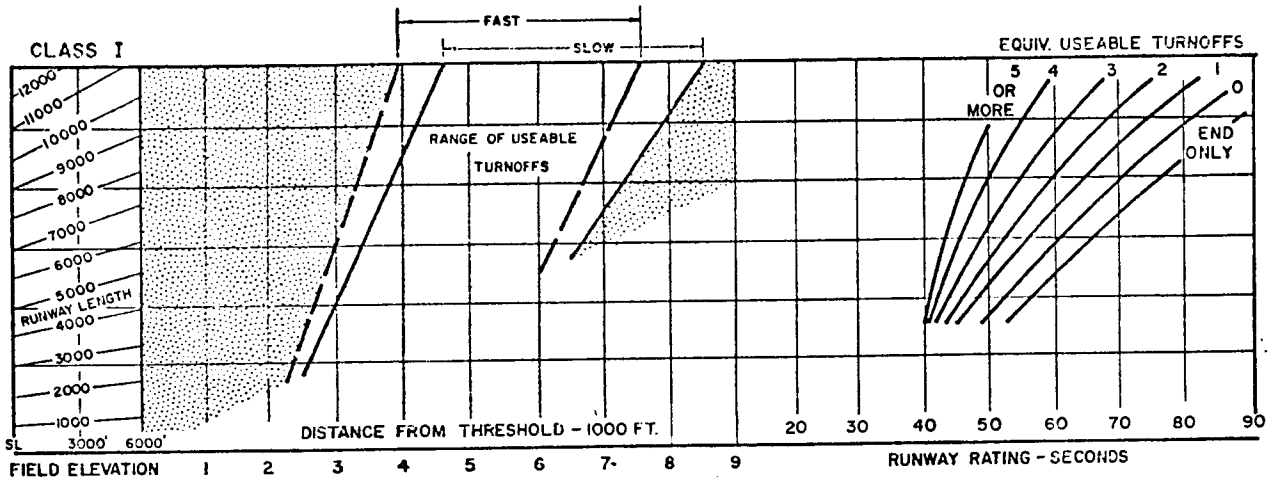


FIGURE 2-1  
**RUNWAY RATING**  
 AVERAGE LANDING OCCUPANCY TIME-SECONDS  
 C-22

Table 2-1

HAC - HOURLY ARRIVAL CAPACITY - Movements Per Hour

Aircraft Class	Runway Rating					
	30	40	50	60	70	80
I	50	47	44	40	35	30
II	57	52	47	42	38	33
III	63	62	58	53	47	41

Use of Table: Enter with Runway Rating for each aircraft class as obtained in Step 2 on Tables 2-4 or 2-5 and read HAC below. Interpolate as required.

Table 2-2

EQUIVALENT MOVEMENT FACTORS

For Touch & Go or Landings in Formation

Landing Procedure	HAC - Movements per Hour							
	30	35	40	45	50	55	60	65
Formation of 2	.58	.59	.61	.62	.64	.65	.67	.68
Formation of 3	.45	.47	.49	.50	.52	.55	.56	.57
Formation of 4	.37	.40	.42	.44	.46	.48	.50	.52
Touch and Go	.17	.20	.23	.25	.27	.30	.33	.37

Use of Table: Enter HAC obtained above (Table 2-1) for each aircraft class and read Equivalent Movement Factors below. Interpolate as required.

Step No.	①		②	③	④	⑤	⑥	⑦
Procedure	From Field Survey or Forecast		Constants	$① \times ②$	$③_S \div ③_G$	Constants	$④_S \times ⑤$	$⑥_G \times \frac{①_G}{③_G}$
Step Definition	Takeoff Demand		Equivalent Movement Factors	Takeoff Equivalent Movements	Class Distribution	Class HDC's	Weighted (HDC) <sub>E</sub>	Weighted (HDC) <sub>A</sub>
	Type Operation	No. of Aircraft						

Aircraft Class I	Single		1.00	
	FORMATION of	2		.60
		3		.47
		4		.40
	Pairs		.50	

				49	
Sub-Totals I	S		S	S	S

Aircraft Class II	Single		1.00	
	FORMATION of	2		.63
		3		.51
		4		.45
	Pairs		.50	

				63	
Sub-Totals II	S		S	S	S

Aircraft Class III	Single		1.00	
	FORMATION of	2		.69
		3		.59
		4		.54
	Pairs		.50	

				90	
Sub-Totals III	S		S	S	S

ALL CLASSES	Grand-Totals	① <sub>G</sub>	③ <sub>G</sub>	④ <sub>G</sub>	⑥ <sub>G</sub>	
-------------	--------------	----------------	----------------	----------------	----------------	--

Table 2-3  
VFR HOURLY DEPARTURE CAPACITY (HDC) ANALYSIS WORK SHEET



Step No.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰						
Procedure	FROM FIELD SURVEY ON FORECAST										USE FIG. No. 21	USE TABLE No. 21	USE TABLE No. 22	⑰-⑱	⑲-⑳	㉑-㉒	CONSTANTS	㉓-㉔	㉕-㉖	㉗-㉘	㉙-㉚	USE FIG. No. 22	㉛-㉜
Step Definition	TYPE OPERATION	No. of LANDING AIRCRAFT			No. of Aircraft		Class Runway Rating	Class HACTs	Landing Equipment Factors	Non Touch & Go Equipment	Touch & Go Equipment	Total Landing Equipment	Touch & Go Equipment Factors	Touch & Go Equipment	Total Landing Equipment Factors	Total Touch & Go Equipment	Percent Landing	Class Distr. Section	Non Touch & Go	Touch & Go	Total	(HMC)E	(HMC)A

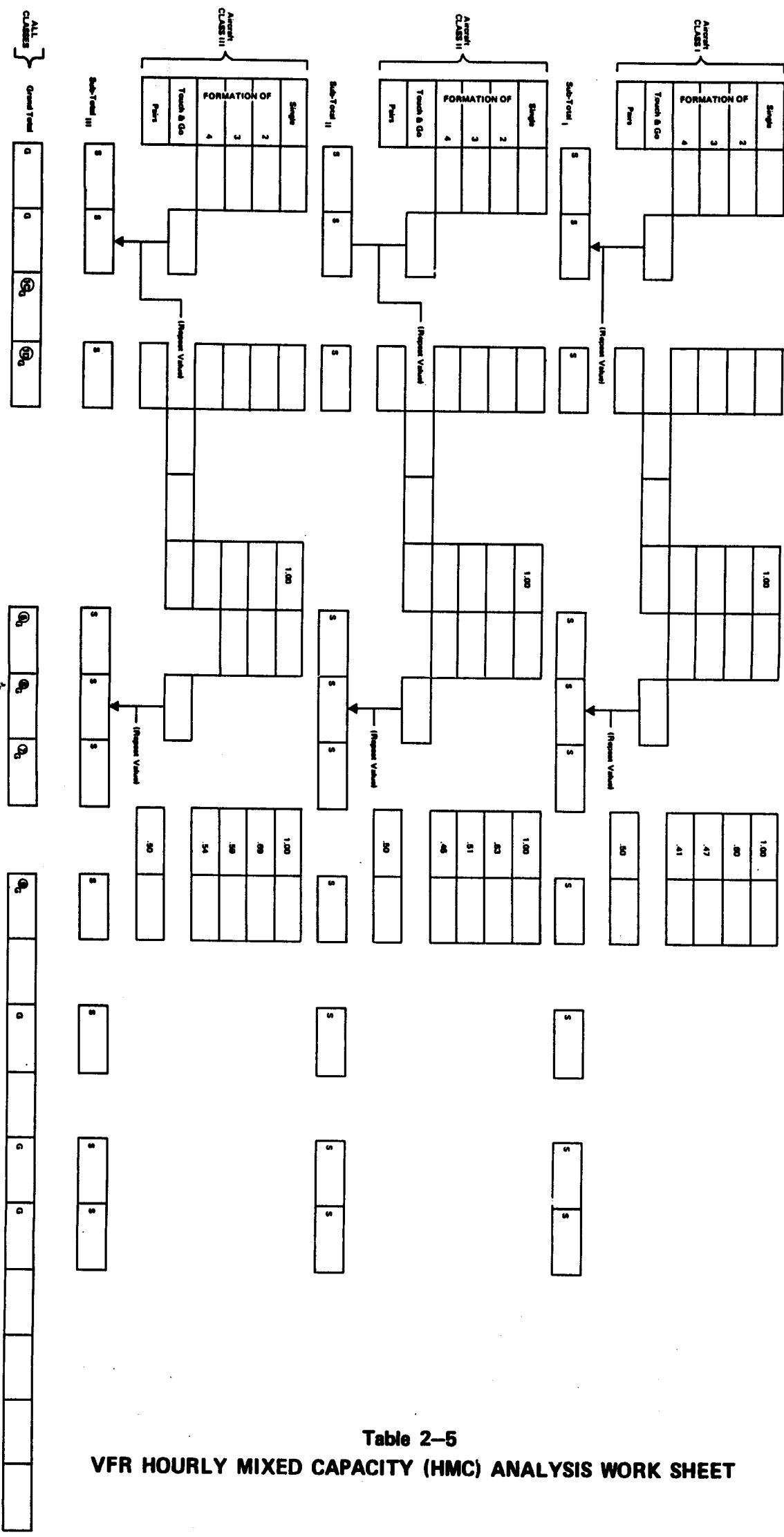


Table 2-5  
VFR HOURLY MIXED CAPACITY (HMC) ANALYSIS WORK SHEET

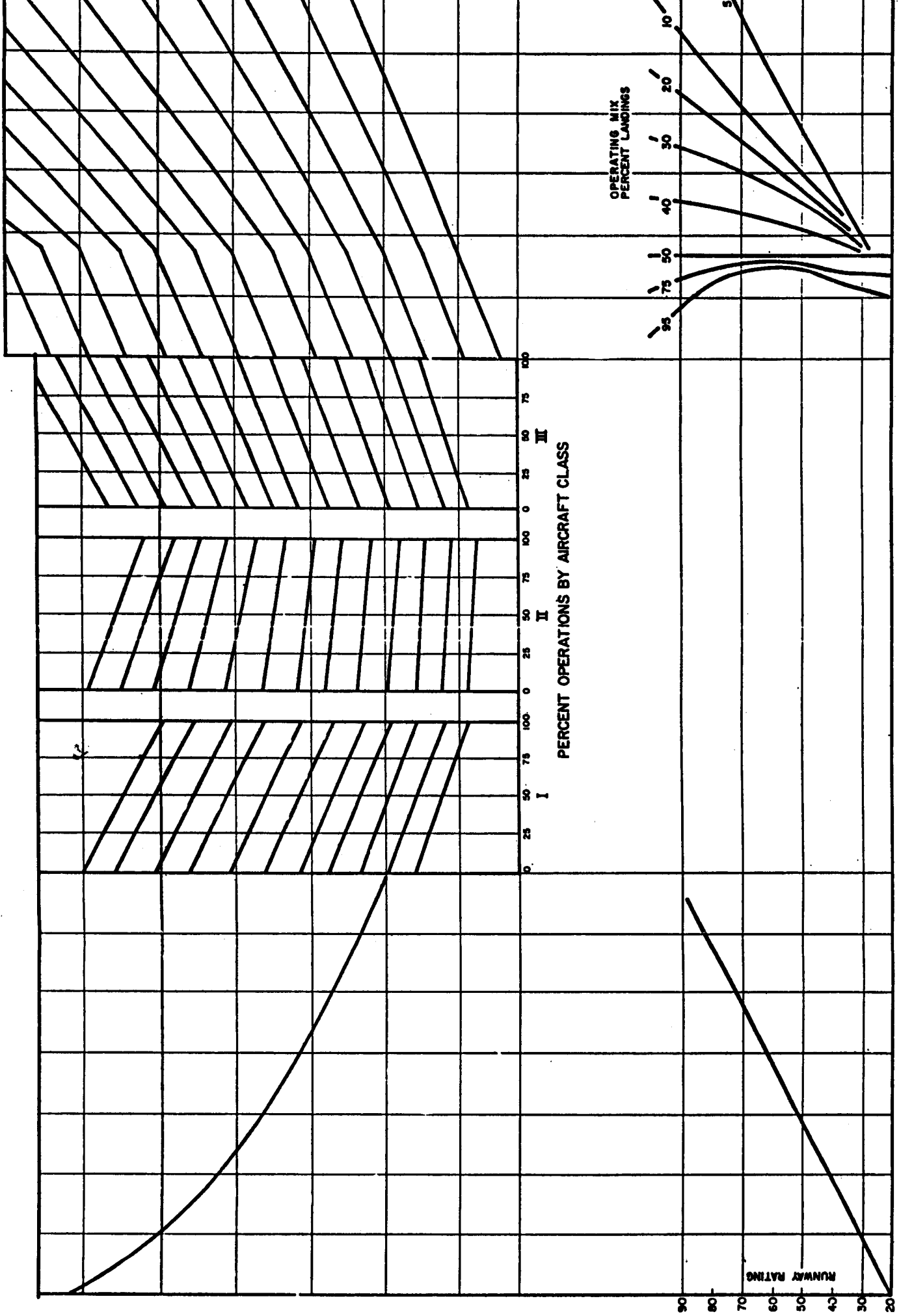


Figure 2-2  
 VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

Table 2-6

IFR CAPACITY (SINGLE RUNWAY)

Type Navaid	Radar												Non-Radar
	PAR (1)						PAR (2) & Conventional						Conventional
Runway Rating	30		60		90		30		60		90		All Rating
Aircraft Class	I&II	III	I&II	III	I&II	III	I&II	III	I&II	III	I&II	III	All Classes
Ratio													

(UNRESTRICTED AIRSPACE)

.2	46	46	43	43	41	41	46	46	43	43	41	41	28
.4	42	42	36	36	34	34	42	42	36	36	34	34	25
.6	42	42	37	37	32	32	42	42	37	37	32	32	21
.8	40	34	34	34	29	29	40	40	34	34	29	29	18
1.0	38	30	32	30	30	30	38	38	32	32	30	30	16
1.2	37	28	33	28	29	28	39	39	33	33	29	29	15
1.5	33	25	33	25	30	25	40	25	33	25	33	33	13
2.0	30	23	30	23	30	23	40	33	33	33	30	30	12
3.0	27	20	27	20	27	20	40	29	33	29	29	29	11
4.0	27	20	27	20	27	20	37	27	35	27	31	27	10

(RESTRICTED AIRSPACE)

.2	30	30	24	24	24	24	30	30	24	24	24	24	28
.4	28	28	21	21	21	21	28	28	21	21	21	21	25
.6	24	24	21	21	21	21	24	24	21	21	21	21	21
.8	24	24	22	22	22	22	24	24	22	22	22	22	18
1.0	26	26	22	22	20	20	26	26	22	22	20	20	16
1.2	26	26	22	22	20	20	26	26	22	22	20	20	15
1.5	26	25	23	23	21	21	26	26	23	23	21	21	13
2.0	27	23	23	23	21	21	27	27	23	23	21	21	12
3.0	27	20	24	20	20	26	28	28	24	24	21	21	11
4.0	25	19	25	19	22	19	30	27	25	25	23	23	10

- PAR (1) - PAR with single approach capability
- PAR (2) - PAR with multiple approach capability
- Conventional - Conventional navaid (VOR, TACAN, NDE)
- I, II, III - Indicates applicable aircraft class
- Unrestricted Airspace - More than one departure path capability
- Restricted Airspace - Single departure path capability
- Ratio -  $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$



Table 2-7

IFR CAPACITIES (PARALLEL RUNWAYS)

Type Navaid	Radar												Non-Radar	
	PAR (1)						PAR (2) & Conventional,						Con.	
Runway Rating	All Ratings						All Ratings						All Ratings	
Aircraft Class	I	II	III	I	II	III	I	II	III	I	II	III	All Classes	
Ratio	(UNRESTRICTED AIRSPACE)													
	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.
.2	54	59	54	72	54	72	54	59	54	72	54	72	28	36
.4	45	69	45	70	45	53	45	69	45	84	45	77	25	28
.6	45	53	45	53	40	40	45	79	45	80	45	59	21	21
.8	45	45	45	45	34	34	45	68	45	67	45	50	18	18
1.0	40	40	40	40	30	30	46	60	46	60	44	44	16	16
1.2	37	37	37	37	27	28	46	55	46	55	40	40	15	15
1.5	33	33	33	33	25	25	45	50	45	50	37	37	13	13
2.0	30	30	30	30	23	23	45	45	45	45	33	33	12	12
3.0	27	27	27	27	20	20	40	40	40	40	29	29	11	11
4.0	25	25	25	25	19	19	38	38	38	38	27	28	10	10
	(RESTRICTED AIRSPACE)													
	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.
.2	30	36	30	36	30	36	30	36	30	36	30	36	28	36
.4	28	42	28	42	28	42	28	42	28	42	28	42	25	28
.6	27	48	27	48	27	40	27	48	27	48	27	48	21	21
.8	25	45	25	45	25	34	25	54	25	54	25	50	18	18
1.0	26	40	26	40	26	30	26	60	26	60	26	44	16	16
1.2	26	37	26	37	26	28	26	55	26	55	26	40	15	15
1.5	25	33	25	33	25	25	25	50	25	50	25	37	13	13
2.0	25	30	25	30	22	23	25	45	25	45	25	33	12	12
3.0	25	27	25	27	20	20	25	40	25	40	25	29	11	11
4.0	25	25	25	25	19	19	26	38	26	38	26	28	10	10

- PAR (1) - PAR with single approach capability
- PAR (2) - PAR with multiple approach capability
- Con. - Conventional navaid (VOR, TACAN, NDE)
- I, II, III - Indicates applicable aircraft class
- Dep. - Release of departure dependent on assured landing on parallel runway (per ATC criteria)
- Ind. - Release of departure not dependent on assured landing on parallel runway (per ATC criteria)
- Ratio =  $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

### Section III. EXAMPLES

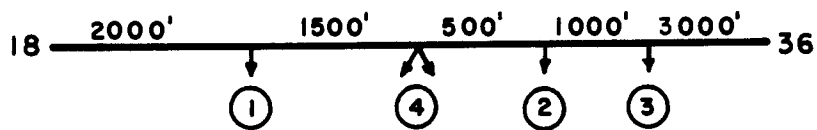
Using the procedures outlined in Section II, this section demonstrates the techniques involved by means of examples, covering the following basic areas:

- . Runway Rating
  - . VFR Capacity
  - . IFR Capacity
  - . Daily Capacity
  - . Application of Figure 2-2
- a. Runway Rating. To successfully calculate the runway rating for a given runway direction, adherence to 6 steps is necessary. These steps, listed below, apply to Figure 2-1 which is reproduced in this section for clarification.
- (1) For each class, enter the runway rating figure with the field elevation.
  - (2) Proceed upward until the proper runway length line is intersected.
  - (3) Draw a line representing the runway, directly across the figure. On this "runway" plot the runway exits where they actually exist based on distance from threshold.
  - (4) Sum up the number of "slow" exits within the slow range.
  - (5) Sum up the number of "fast" exits within the fast range; multiply this number by two. If a fast exit falls in the "slow" range, but out of the fast range, count it as a "slow" exit.

- (6) The sum of steps 4 and 5 are the equivalent usable exits. Extend the horizontal runway line over to the appropriate usable turnoff lines and read the runway rating on the axis below.

(Example 1)

R/W 18-36 is 8,000 feet long and is at sea level (sl). Calculate the runway rating in the R/W 18 direction for all three classes of aircraft. The plan view of Runway 18-36 looks like:



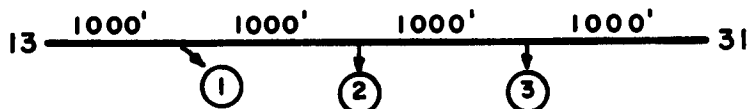
Exits ① ② and ③ are "slow."  
Exit ④ is "fast."

Utilizing the aforementioned steps and Figure 2-1 (Example) on page C-33, the runway ratings are calculated to be:

Class I	48 sec.
Class II	38 sec.
Class III	39 sec.

(Example 2)

R/W 13-31 is 4,000 feet long and is 3,000 feet above sea level. The layout of exits as shown below:



Exits ② and ③ are "slow."  
Exit ① is "fast."

Calculate the runway rating in the R/W 13 direction for Class III aircraft. The calculations are shown on Figure 2-1 (Example) on page C-34 with the rating calculated at 30 sec.

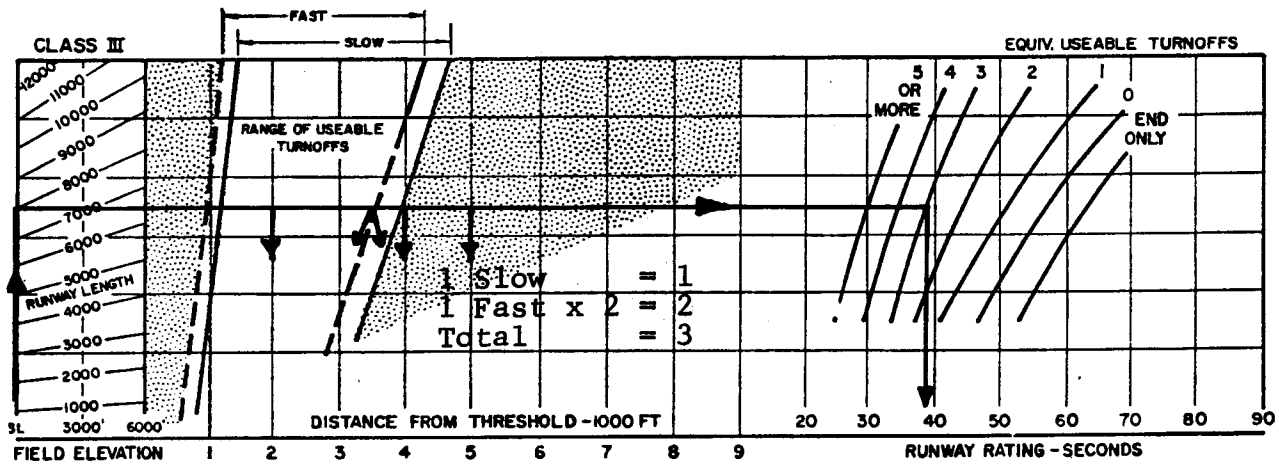
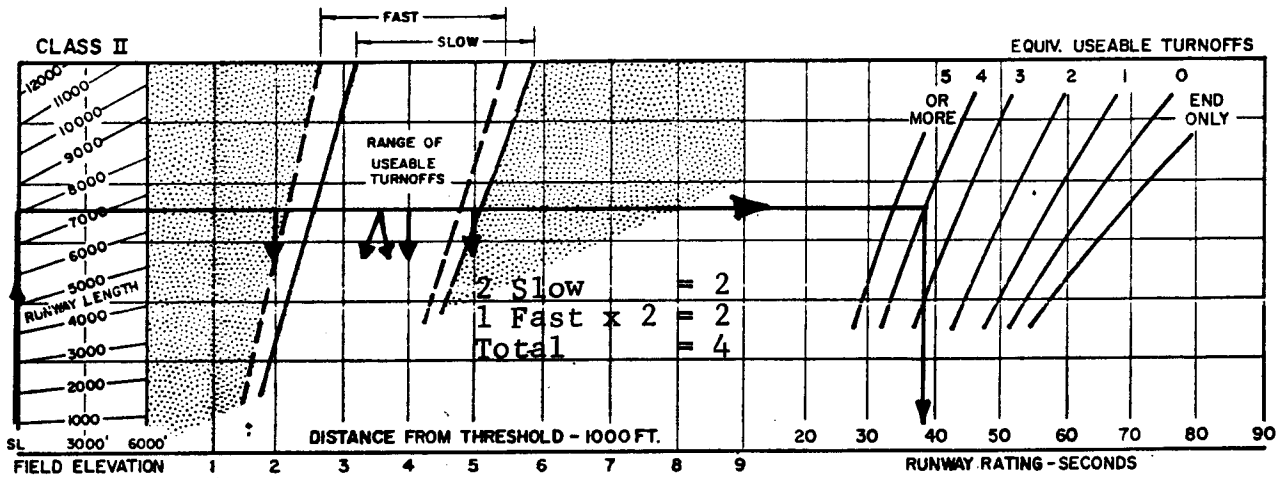
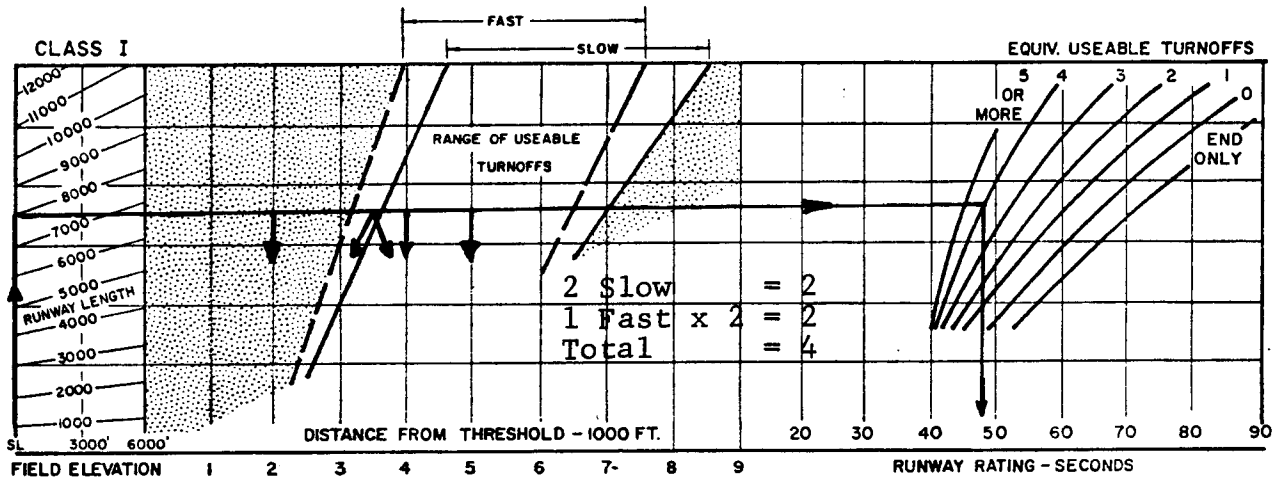


FIGURE 2-1 (Example)  
**RUNWAY RATING**  
 AVERAGE LANDING OCCUPANCY TIME-SECONDS

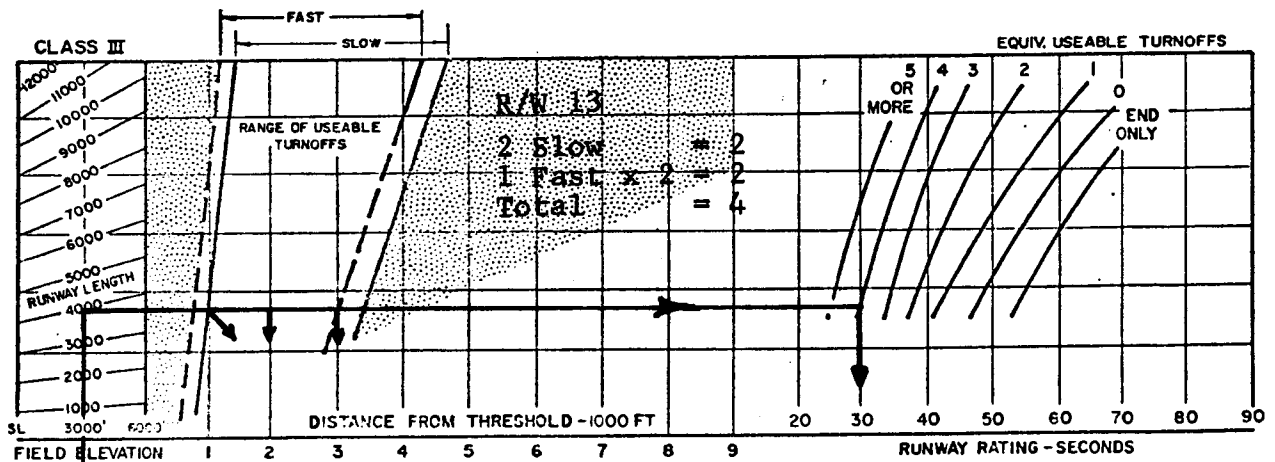
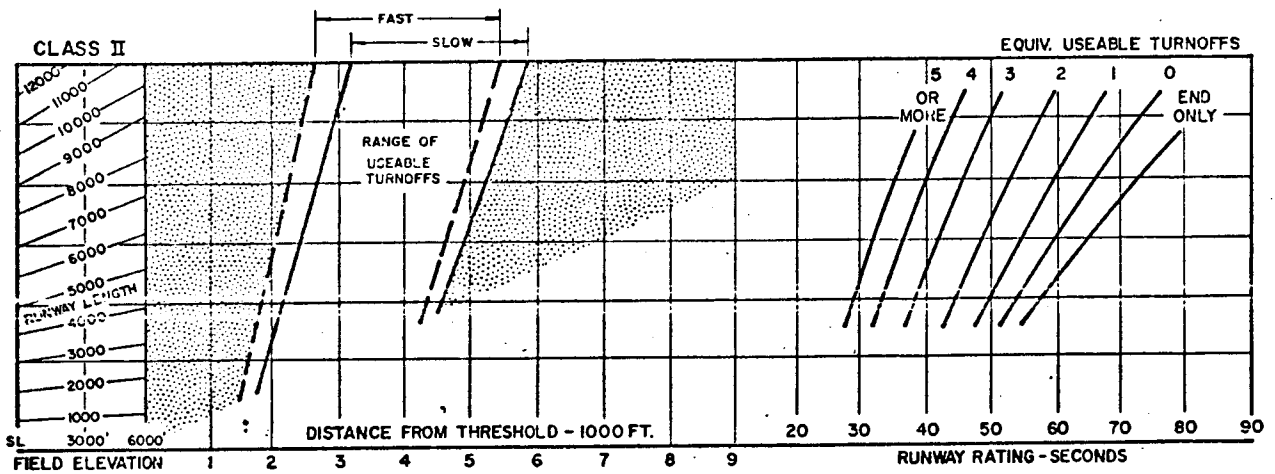
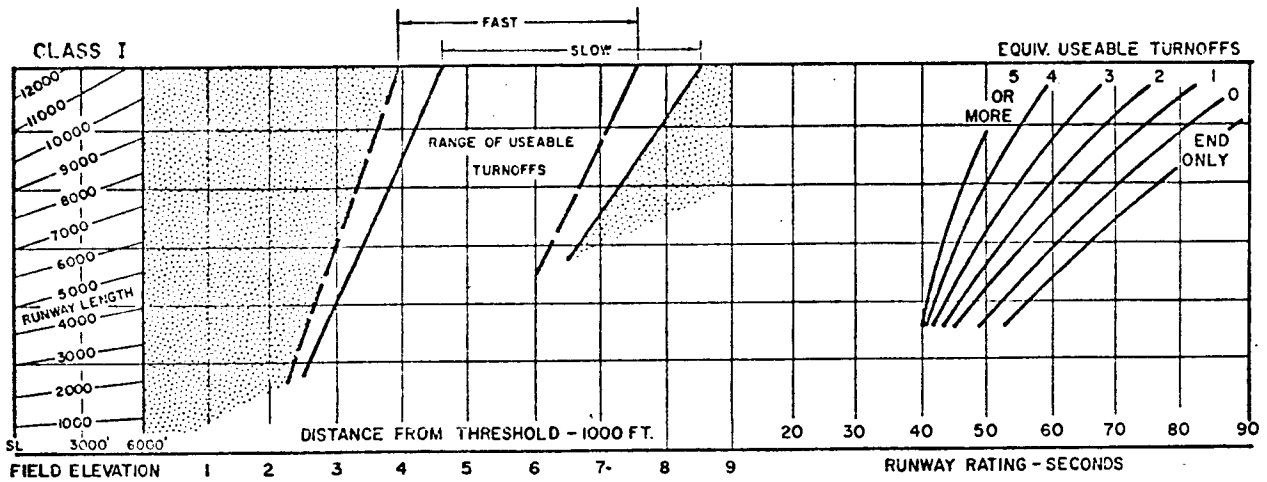


FIGURE 2-1 (Example)

**RUNWAY RATING**

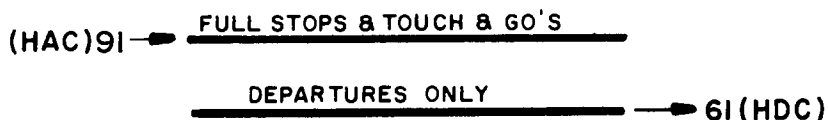
AVERAGE LANDING OCCUPANCY TIME-SECONDS

b. VFR Capacity. In these examples, the calculation of VFR runway capacities use Figure 2-2, Tables 2-1, 2-2, 2-3, 2-4, and 2-5. These figures and tables are reproduced for these examples on page numbers C-40 to C-44 (Example 1) and C-45 to C-49 (Example 2).

(Example 1)

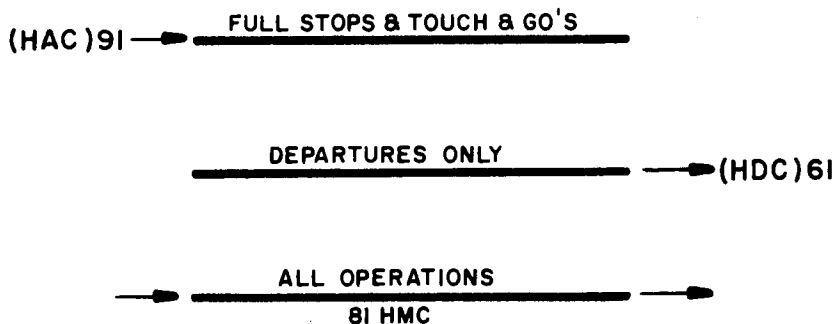
<b>Mission</b>	Jet fighter base.
<b>Base Layout</b>	Two 10,000' parallel runways, 1,500' centerline separation. 3,000' above sea level.
<b>Manner of Operations</b>	Arrivals on one runway; departures on the other.
<b>Type of Aircraft</b>	A6, A4, F4
<b>Aircraft Classification</b>	Class I
<b>Operations Conducted</b>	Formation arrivals and departures; Touch and Go's
<b>Daily Activity (from survey)</b>	300 single departures, 300 single arrivals, 100 aircraft in formation departures of 2, 100 aircraft in formation departures of 4, 100 aircraft in formation arrivals of 2, 100 aircraft in formation arrivals of 4, 600 Touch and Go's.
<b>Exits</b>	Two usable slows ) = 4 equivalent One usable fast ) = turnoffs Runway Rating = 55 sec. (Assumed previous calculation)

Results



At a ratio of 2.2 (1100 arrivals divided by 500 departures per example "daily activity" input), the hourly total capacity equals 132 operations per hour; refer calculation procedure discussed on page numbers C-20 and C-21.

Question: What is the capacity if a third parallel is added 5,000' from the existing outboard runway? Mixed operations on new runway.



Total capacity = 132 (from above calculation) + 81 = 213 operations per hour.

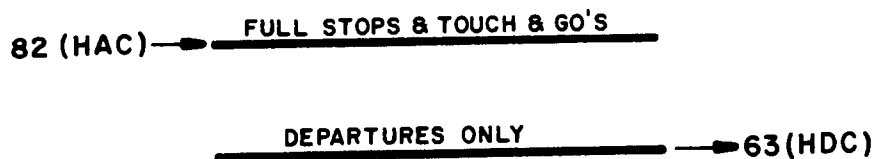
(Example 2)

The air station undergoes a partial change in mission. Several squadrons of P-3's are moved in to serve as a coastal anti-submarine group. It is now necessary to recompute capacity with this new demand.



Mission	Jet fighter training, Coastal watch
Base Layout	Same as previous example.
Aircraft Classification	I and II
Manner of Operation	Same as previous example.
Operations Conducted	Touch and Go's; Formations
Daily Activity	Same as previous example except for a 200 movement increase in single arrivals and departures generated by the P-3's.
Exits	Runway rating = 55 (Class I) Runway rating = 43 (Class II) (assumed previous calculation)

Results:



At a ratio of 1.86 (1300 arrivals divided by 700 departures per example "daily activity" input), the hourly total capacity equals 126 operations per hour; refer calculation procedure discussed on page numbers C-20 and C-21.

Question: What is the capacity if the ratio of arrivals to departures equals 2.0?

$$\text{Hourly Total Capacity (HTC)} = \frac{\text{HAC} \times (1 + \text{Ratio})}{\text{Ratio}}$$

"or"

$$\text{HDC} \times (1 + \text{Ratio}),$$

whichever is less.

$$\text{Therefore, HTC} = \frac{82 \times (1 + 2)}{2} = \frac{82 \times 3}{2} = 123$$

(Other formula results in higher value of 189.)

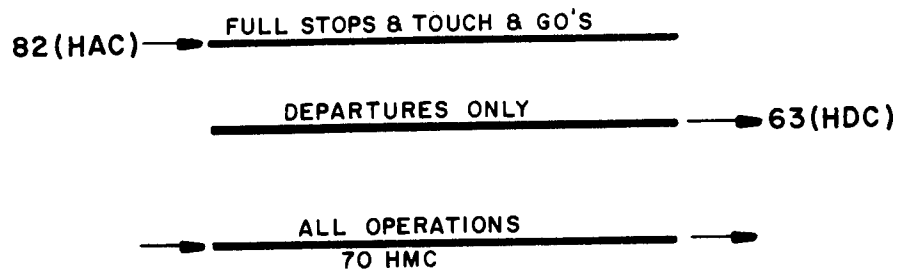
Question: What is the capacity if the ratio equals 0.8?

$$\text{HTC} = \text{HDC} \times (1 + \text{Ratio}) =$$

$$63 \times 1.8 = 113.4 \text{ (113)}$$

(Other formula results in higher value of 184.5.)

Question: What is the capacity if a third parallel is added 5,000' from the existing outboard runway? Mixed operations are to be conducted on this runway.



Total Capacity = 126 (from above calculation based on Ratio = 1.86) + 70 = 196 operations per hour.

Step No.	①		②	③	④	⑤	⑥	⑦
Procedure	From Field Survey or Forecast		Constants	①×②	③ <sub>S</sub> ÷ ③ <sub>G</sub>	Constants	④ <sub>S</sub> × ⑤	⑥ <sub>G</sub> × $\frac{①_G}{③_G}$
Step Definition	Takeoff Demand		Equivalent Movement Factors	Takeoff Equivalent Movements	Class Distribution	Class HDC's	Weighted (HDC) <sub>E</sub>	Weighted (HDC) <sub>A</sub>
	Type Operation	No. of Aircraft						

Aircraft Class I	Single	300	1.00	300	
	FORMATION of	2	100	.60	60
		3	-	.47	-
		4	100	.40	40
	Pairs	-	.50	-	

			49	
Sub-Totals I	S 500	S 400	S 1.0	S 49

Aircraft Class II	Single		1.00	
	FORMATION of	2	.63	
		3	.51	
		4	.45	
	Pairs		.50	

			63	
Sub-Totals II	S	S	S	S

Aircraft Class III	Single		1.00	
	FORMATION of	2	.69	
		3	.59	
		4	.54	
	Pairs		.50	

			90	
Sub-Totals III	S	S	S	S

ALL CLASSES	Grand-Totals	① <sub>G</sub> 500	③ <sub>G</sub> 400	④ <sub>G</sub> 1.0	⑥ <sub>G</sub> 49	61
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Table 2-3/EXAMPLE 1

VFR HOURLY DEPARTURE CAPACITY (HDC) ANALYSIS WORK SHEET

Step No.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
Procedure	FROM FIELD SURVEY OR FORECAST														
	USE TABLE No. 2-1	USE TABLE No. 2-1	USE TABLE No. 2-2	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮
Step Definition	LANDING DEMAND			Equivalent Movement Factors	Non Touch & Go Equivalent Movements	Touch & Go Equivalent Movements	Total Equivalent Movement	Non Touch & Go Class Distribution	Touch & Go Class Distribution	Non Touch & Go Weighted HAC	Touch & Go Weighted HAC's	Touch & Go Weighted HAC	Weighted (HAC) E	Weighted (HAC) A	
	Type Operation	No. of Aircraft	Total												
	Non Touch & Go	Touch & Go	Total												
Aircraft Class I	Single	300		1.00	300										
	2	100		.61	61										
	3	-		-	-										
	4	100		.43	43										
	Touch & Go		600	.24	144										
	Sub-Total I		500		500		55	42							
Aircraft Class II	Single			1.00											
	2														
	3														
	4														
	Touch & Go														
	Sub-Total II														
Aircraft Class III	Single			1.00											
	2														
	3														
	4														
	Touch & Go														
	Sub-Total III														
ALL CLASSES	Grand Total		600		600		55	42							

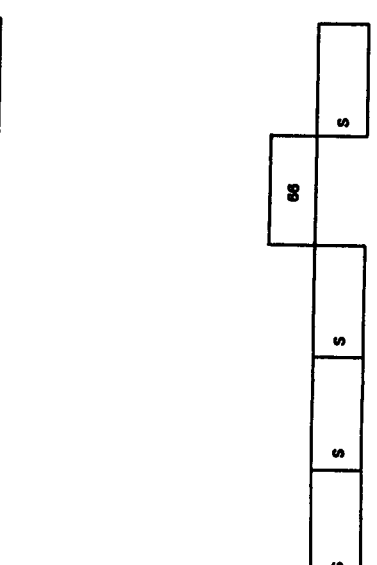
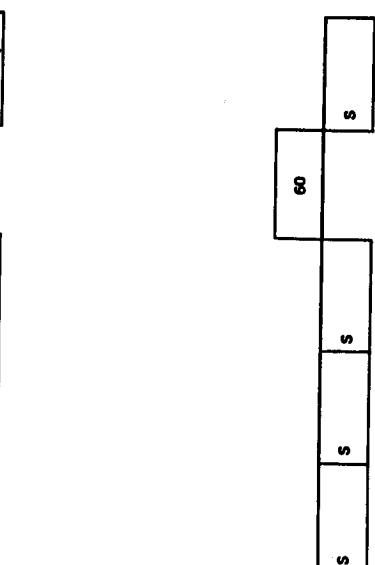
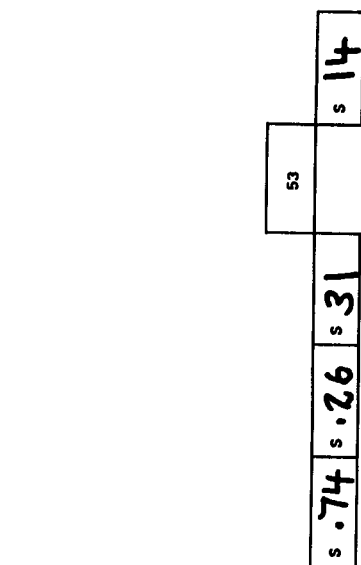


Table 2-4/EXAMPLE 1

VFR HOURLY ARRIVAL CAPACITY (HAC) ANALYSIS WORK SHEET

Table 2-1/Example 1

HAC - HOURLY ARRIVAL CAPACITY - Movements Per Hour

Aircraft Class	Runway Rating					
	30	40	50	60	70	80
I	50	47	44	40	35	30
II	57	52	47	42	38	33
III	63	62	58	53	47	41

Interpolate between 44 and 40; Use 42.

Table 2-2/Example 1

EQUIVALENT MOVEMENT FACTORS  
For Touch & Go or Landings in Formation

Landing Procedure	HAC - Movements per Hour							
	30	35	40	45	50	55	60	65
Formation of 2	.58	.59	.61	.62	.64	.65	.67	.68
Formation of 3	.45	.47	.49	.50	.52	.55	.56	.57
Formation of 4	.37	.40	.42	.44	.46	.48	.50	.52
Touch and Go	.17	.20	.23	.25	.27	.30	.33	.37

For 42, interpolate and use .61

.49\*

.43

.24

\*This value not needed in example.

Step No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Procedure	FROM FIELD SURVEY ON FORECAST																		
Step Definition	TYPE OPERATION	No. of LANDING AIRCRAFT			No. of Taxi/ Aircraft	USE FIG. No. 2-1	USE TABLE No. 2-1	USE TABLE No. 2-2	Landing Equivalent Factor	Non Touch & Go Movements	Touch & Go Movements	Total Landing Movements	CONSTANTS	Taxi/ Equivalent Factor	Taxi/ Movements	Total Taxi/ And Landings	Total Take-off & Land Movements	Percent Landing	Class Divn. - Touch & Go
		Non Touch & Go	Touch & Go	Total															

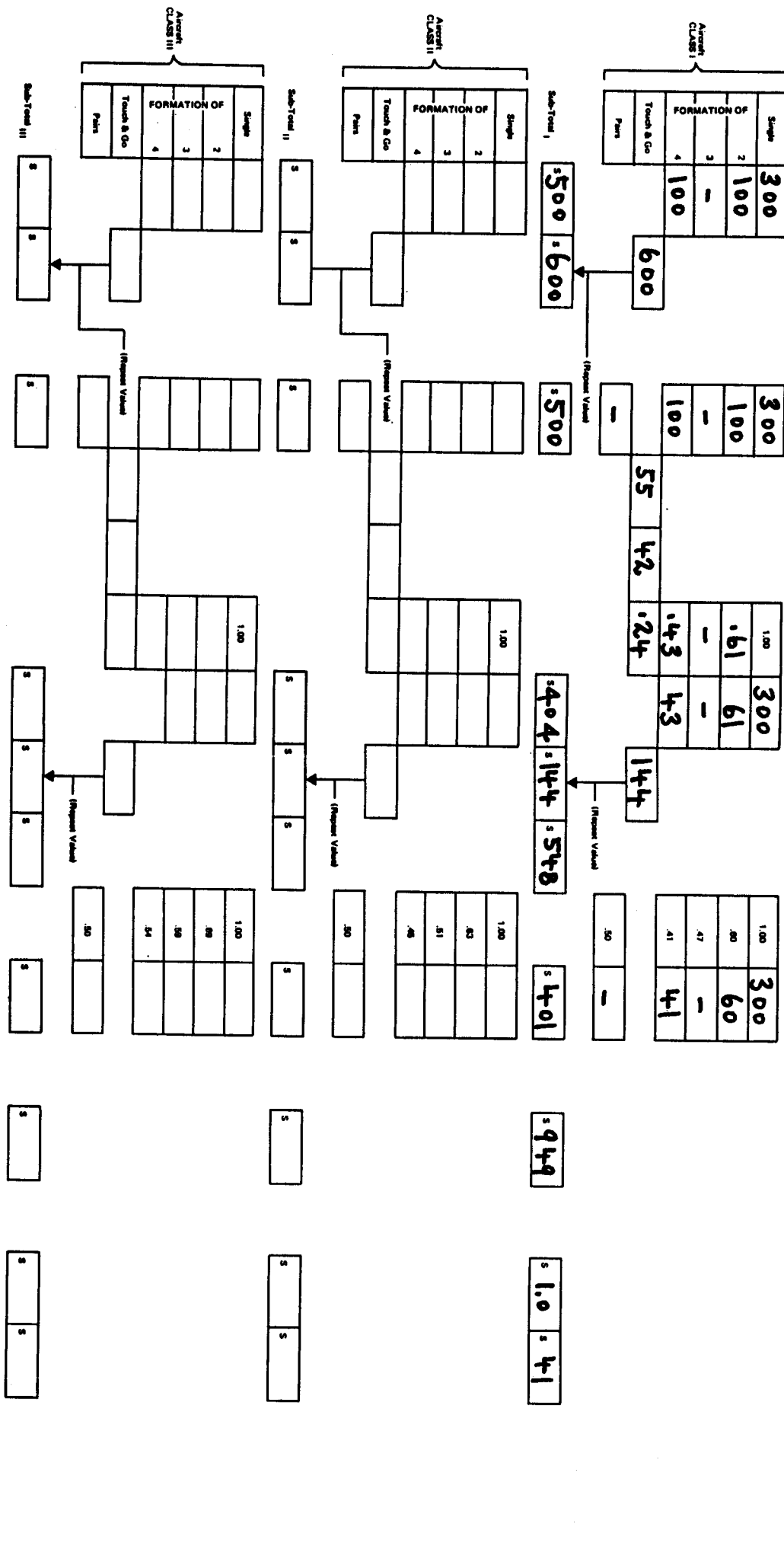


Table 2-5/EXAMPLE 1  
VFR HOURLY MIXED CAPACITY (HMC) ANALYSIS WORK SHEET

ALL CLASSES	Grand Total
500	600
1100	500
404	144
548	548
401	1600
949	949
58	1.0
41	41
5	5
46	46
48	48
81	81

CROSS CHECK: Sum Q1 + Q2 + Q3 + Q4 + Q5 + Q6 + Q7 + Q8 + Q9 + Q10 + Q11 + Q12 + Q13 + Q14 + Q15 + Q16 + Q17 + Q18 + Q19 + Q20 + Q21 + Q22 + Q23 + Q24 + Q25 + Q26 + Q27 + Q28 + Q29 + Q30 + Q31 + Q32 + Q33 + Q34 + Q35 + Q36 + Q37 + Q38 + Q39 + Q40 + Q41 + Q42 + Q43 + Q44 + Q45 + Q46 + Q47 + Q48 + Q49 + Q50 + Q51 + Q52 + Q53 + Q54 + Q55 + Q56 + Q57 + Q58 + Q59 + Q60 + Q61 + Q62 + Q63 + Q64 + Q65 + Q66 + Q67 + Q68 + Q69 + Q70 + Q71 + Q72 + Q73 + Q74 + Q75 + Q76 + Q77 + Q78 + Q79 + Q80 + Q81 + Q82 + Q83 + Q84 + Q85 + Q86 + Q87 + Q88 + Q89 + Q90 + Q91 + Q92 + Q93 + Q94 + Q95 + Q96 + Q97 + Q98 + Q99 + Q100 + Q101 + Q102 + Q103 + Q104 + Q105 + Q106 + Q107 + Q108 + Q109 + Q110 + Q111 + Q112 + Q113 + Q114 + Q115 + Q116 + Q117 + Q118 + Q119 + Q120 + Q121 + Q122 + Q123 + Q124 + Q125 + Q126 + Q127 + Q128 + Q129 + Q130 + Q131 + Q132 + Q133 + Q134 + Q135 + Q136 + Q137 + Q138 + Q139 + Q140 + Q141 + Q142 + Q143 + Q144 + Q145 + Q146 + Q147 + Q148 + Q149 + Q150 + Q151 + Q152 + Q153 + Q154 + Q155 + Q156 + Q157 + Q158 + Q159 + Q160 + Q161 + Q162 + Q163 + Q164 + Q165 + Q166 + Q167 + Q168 + Q169 + Q170 + Q171 + Q172 + Q173 + Q174 + Q175 + Q176 + Q177 + Q178 + Q179 + Q180 + Q181 + Q182 + Q183 + Q184 + Q185 + Q186 + Q187 + Q188 + Q189 + Q190 + Q191 + Q192 + Q193 + Q194 + Q195 + Q196 + Q197 + Q198 + Q199 + Q200 + Q201 + Q202 + Q203 + Q204 + Q205 + Q206 + Q207 + Q208 + Q209 + Q210 + Q211 + Q212 + Q213 + Q214 + Q215 + Q216 + Q217 + Q218 + Q219 + Q220 + Q221 + Q222 + Q223 + Q224 + Q225 + Q226 + Q227 + Q228 + Q229 + Q230 + Q231 + Q232 + Q233 + Q234 + Q235 + Q236 + Q237 + Q238 + Q239 + Q240 + Q241 + Q242 + Q243 + Q244 + Q245 + Q246 + Q247 + Q248 + Q249 + Q250 + Q251 + Q252 + Q253 + Q254 + Q255 + Q256 + Q257 + Q258 + Q259 + Q260 + Q261 + Q262 + Q263 + Q264 + Q265 + Q266 + Q267 + Q268 + Q269 + Q270 + Q271 + Q272 + Q273 + Q274 + Q275 + Q276 + Q277 + Q278 + Q279 + Q280 + Q281 + Q282 + Q283 + Q284 + Q285 + Q286 + Q287 + Q288 + Q289 + Q290 + Q291 + Q292 + Q293 + Q294 + Q295 + Q296 + Q297 + Q298 + Q299 + Q300 + Q301 + Q302 + Q303 + Q304 + Q305 + Q306 + Q307 + Q308 + Q309 + Q310 + Q311 + Q312 + Q313 + Q314 + Q315 + Q316 + Q317 + Q318 + Q319 + Q320 + Q321 + Q322 + Q323 + Q324 + Q325 + Q326 + Q327 + Q328 + Q329 + Q330 + Q331 + Q332 + Q333 + Q334 + Q335 + Q336 + Q337 + Q338 + Q339 + Q340 + Q341 + Q342 + Q343 + Q344 + Q345 + Q346 + Q347 + Q348 + Q349 + Q350 + Q351 + Q352 + Q353 + Q354 + Q355 + Q356 + Q357 + Q358 + Q359 + Q360 + Q361 + Q362 + Q363 + Q364 + Q365 + Q366 + Q367 + Q368 + Q369 + Q370 + Q371 + Q372 + Q373 + Q374 + Q375 + Q376 + Q377 + Q378 + Q379 + Q380 + Q381 + Q382 + Q383 + Q384 + Q385 + Q386 + Q387 + Q388 + Q389 + Q390 + Q391 + Q392 + Q393 + Q394 + Q395 + Q396 + Q397 + Q398 + Q399 + Q400 + Q401 + Q402 + Q403 + Q404 + Q405 + Q406 + Q407 + Q408 + Q409 + Q410 + Q411 + Q412 + Q413 + Q414 + Q415 + Q416 + Q417 + Q418 + Q419 + Q420 + Q421 + Q422 + Q423 + Q424 + Q425 + Q426 + Q427 + Q428 + Q429 + Q430 + Q431 + Q432 + Q433 + Q434 + Q435 + Q436 + Q437 + Q438 + Q439 + Q440 + Q441 + Q442 + Q443 + Q444 + Q445 + Q446 + Q447 + Q448 + Q449 + Q450 + Q451 + Q452 + Q453 + Q454 + Q455 + Q456 + Q457 + Q458 + Q459 + Q460 + Q461 + Q462 + Q463 + Q464 + Q465 + Q466 + Q467 + Q468 + Q469 + Q470 + Q471 + Q472 + Q473 + Q474 + Q475 + Q476 + Q477 + Q478 + Q479 + Q480 + Q481 + Q482 + Q483 + Q484 + Q485 + Q486 + Q487 + Q488 + Q489 + Q490 + Q491 + Q492 + Q493 + Q494 + Q495 + Q496 + Q497 + Q498 + Q499 + Q500 + Q501 + Q502 + Q503 + Q504 + Q505 + Q506 + Q507 + Q508 + Q509 + Q510 + Q511 + Q512 + Q513 + Q514 + Q515 + Q516 + Q517 + Q518 + Q519 + Q520 + Q521 + Q522 + Q523 + Q524 + Q525 + Q526 + Q527 + Q528 + Q529 + Q530 + Q531 + Q532 + Q533 + Q534 + Q535 + Q536 + Q537 + Q538 + Q539 + Q540 + Q541 + Q542 + Q543 + Q544 + Q545 + Q546 + Q547 + Q548 + Q549 + Q550 + Q551 + Q552 + Q553 + Q554 + Q555 + Q556 + Q557 + Q558 + Q559 + Q560 + Q561 + Q562 + Q563 + Q564 + Q565 + Q566 + Q567 + Q568 + Q569 + Q570 + Q571 + Q572 + Q573 + Q574 + Q575 + Q576 + Q577 + Q578 + Q579 + Q580 + Q581 + Q582 + Q583 + Q584 + Q585 + Q586 + Q587 + Q588 + Q589 + Q590 + Q591 + Q592 + Q593 + Q594 + Q595 + Q596 + Q597 + Q598 + Q599 + Q600 + Q601 + Q602 + Q603 + Q604 + Q605 + Q606 + Q607 + Q608 + Q609 + Q610 + Q611 + Q612 + Q613 + Q614 + Q615 + Q616 + Q617 + Q618 + Q619 + Q620 + Q621 + Q622 + Q623 + Q624 + Q625 + Q626 + Q627 + Q628 + Q629 + Q630 + Q631 + Q632 + Q633 + Q634 + Q635 + Q636 + Q637 + Q638 + Q639 + Q640 + Q641 + Q642 + Q643 + Q644 + Q645 + Q646 + Q647 + Q648 + Q649 + Q650 + Q651 + Q652 + Q653 + Q654 + Q655 + Q656 + Q657 + Q658 + Q659 + Q660 + Q661 + Q662 + Q663 + Q664 + Q665 + Q666 + Q667 + Q668 + Q669 + Q670 + Q671 + Q672 + Q673 + Q674 + Q675 + Q676 + Q677 + Q678 + Q679 + Q680 + Q681 + Q682 + Q683 + Q684 + Q685 + Q686 + Q687 + Q688 + Q689 + Q690 + Q691 + Q692 + Q693 + Q694 + Q695 + Q696 + Q697 + Q698 + Q699 + Q700 + Q701 + Q702 + Q703 + Q704 + Q705 + Q706 + Q707 + Q708 + Q709 + Q710 + Q711 + Q712 + Q713 + Q714 + Q715 + Q716 + Q717 + Q718 + Q719 + Q720 + Q721 + Q722 + Q723 + Q724 + Q725 + Q726 + Q727 + Q728 + Q729 + Q730 + Q731 + Q732 + Q733 + Q734 + Q735 + Q736 + Q737 + Q738 + Q739 + Q740 + Q741 + Q742 + Q743 + Q744 + Q745 + Q746 + Q747 + Q748 + Q749 + Q750 + Q751 + Q752 + Q753 + Q754 + Q755 + Q756 + Q757 + Q758 + Q759 + Q760 + Q761 + Q762 + Q763 + Q764 + Q765 + Q766 + Q767 + Q768 + Q769 + Q770 + Q771 + Q772 + Q773 + Q774 + Q775 + Q776 + Q777 + Q778 + Q779 + Q780 + Q781 + Q782 + Q783 + Q784 + Q785 + Q786 + Q787 + Q788 + Q789 + Q790 + Q791 + Q792 + Q793 + Q794 + Q795 + Q796 + Q797 + Q798 + Q799 + Q800 + Q801 + Q802 + Q803 + Q804 + Q805 + Q806 + Q807 + Q808 + Q809 + Q810 + Q811 + Q812 + Q813 + Q814 + Q815 + Q816 + Q817 + Q818 + Q819 + Q820 + Q821 + Q822 + Q823 + Q824 + Q825 + Q826 + Q827 + Q828 + Q829 + Q830 + Q831 + Q832 + Q833 + Q834 + Q835 + Q836 + Q837 + Q838 + Q839 + Q840 + Q841 + Q842 + Q843 + Q844 + Q845 + Q846 + Q847 + Q848 + Q849 + Q850 + Q851 + Q852 + Q853 + Q854 + Q855 + Q856 + Q857 + Q858 + Q859 + Q860 + Q861 + Q862 + Q863 + Q864 + Q865 + Q866 + Q867 + Q868 + Q869 + Q870 + Q871 + Q872 + Q873 + Q874 + Q875 + Q876 + Q877 + Q878 + Q879 + Q880 + Q881 + Q882 + Q883 + Q884 + Q885 + Q886 + Q887 + Q888 + Q889 + Q890 + Q891 + Q892 + Q893 + Q894 + Q895 + Q896 + Q897 + Q898 + Q899 + Q900 + Q901 + Q902 + Q903 + Q904 + Q905 + Q906 + Q907 + Q908 + Q909 + Q910 + Q911 + Q912 + Q913 + Q914 + Q915 + Q916 + Q917 + Q918 + Q919 + Q920 + Q921 + Q922 + Q923 + Q924 + Q925 + Q926 + Q927 + Q928 + Q929 + Q930 + Q931 + Q932 + Q933 + Q934 + Q935 + Q936 + Q937 + Q938 + Q939 + Q940 + Q941 + Q942 + Q943 + Q944 + Q945 + Q946 + Q947 + Q948 + Q949 + Q950 + Q951 + Q952 + Q953 + Q954 + Q955 + Q956 + Q957 + Q958 + Q959 + Q960 + Q961 + Q962 + Q963 + Q964 + Q965 + Q966 + Q967 + Q968 + Q969 + Q970 + Q971 + Q972 + Q973 + Q974 + Q975 + Q976 + Q977 + Q978 + Q979 + Q980 + Q981 + Q982 + Q983 + Q984 + Q985 + Q986 + Q987 + Q988 + Q989 + Q990 + Q991 + Q992 + Q993 + Q994 + Q995 + Q996 + Q997 + Q998 + Q999 + Q1000 + Q1001 + Q1002 + Q1003 + Q1004 + Q1005 + Q1006 + Q1007 + Q1008 + Q1009 + Q1010 + Q1011 + Q1012 + Q1013 + Q1014 + Q1015 + Q1016 + Q1017 + Q1018 + Q1019 + Q1020 + Q1021 + Q1022 + Q1023 + Q1024 + Q1025 + Q1026 + Q1027 + Q1028 + Q1029 + Q1030 + Q1031 + Q1032 + Q1033 + Q1034 + Q1035 + Q1036 + Q1037 + Q1038 + Q1039 + Q1040 + Q1041 + Q1042 + Q1043 + Q1044 + Q1045 + Q1046 + Q1047 + Q1048 + Q1049 + Q1050 + Q1051 + Q1052 + Q1053 + Q1054 + Q1055 + Q1056 + Q1057 + Q1058 + Q1059 + Q1060 + Q1061 + Q1062 + Q1063 + Q1064 + Q1065 + Q1066 + Q1067 + Q1068 + Q1069 + Q1070 + Q1071 + Q1072 + Q1073 + Q1074 + Q1075 + Q1076 + Q1077 + Q1078 + Q1079 + Q1080 + Q1081 + Q1082 + Q1083 + Q1084 + Q1085 + Q1086 + Q1087 + Q1088 + Q1089 + Q1090 + Q1091 + Q1092 + Q1093 + Q1094 + Q1095 + Q1096 + Q1097 + Q1098 + Q1099 + Q1100 + Q1101 + Q1102 + Q1103 + Q1104 + Q1105 + Q1106 + Q1107 + Q1108 + Q1109 + Q1110 + Q1111 + Q1112 + Q1113 + Q1114 + Q1115 + Q1116 + Q1117 + Q1118 + Q1119 + Q1120 + Q1121 + Q1122 + Q1123 + Q1124 + Q1125 + Q1126 + Q1127 + Q1128 + Q1129 + Q1130 + Q1131 + Q1132 + Q1133 + Q1134 + Q1135 + Q1136 + Q1137 + Q1138 + Q1139 + Q1140 + Q1141 + Q1142 + Q1143 + Q1144 + Q1145 + Q1146 + Q1147 + Q1148 + Q1149 + Q1150 + Q1151 + Q1152 + Q1153 + Q1154 + Q1155 + Q1156 + Q1157 + Q1158 + Q1159 + Q1160 + Q1161 + Q1162 + Q1163 + Q1164 + Q1165 + Q1166 + Q1167 + Q1168 + Q1169 + Q1170 + Q1171 + Q1172 + Q1173 + Q1174 + Q1175 + Q1176 + Q1177 + Q1178 + Q1179 + Q1180 + Q1181 + Q1182 + Q1183 + Q1184 + Q1185 + Q1186 + Q1187 + Q1188 + Q1189 + Q1190 + Q1191 + Q1192 + Q1193 + Q1194 + Q1195 + Q1196 + Q1197 + Q1198 + Q1199 + Q1200 + Q1201 + Q1202 + Q1203 + Q1204 + Q1205 + Q1206 + Q1207 + Q1208 + Q1209 + Q1210 + Q1211 + Q1212 + Q1213 + Q1214 + Q1215 + Q1216 + Q1217 + Q1218 + Q1219 + Q1220 + Q1221 + Q1222 + Q1223 + Q1224 + Q1225 + Q1226 + Q1227 + Q1228 + Q1229 + Q1230 + Q1231 + Q1232 + Q1233 + Q1234 + Q1235 + Q1236 + Q1237 + Q1238 + Q1239 + Q1240 + Q1241 + Q1242 + Q1243 + Q1244 + Q1245 + Q1246 + Q1247 + Q1248 + Q1249 + Q1250 + Q1251 + Q1252 + Q1253 + Q1254 + Q1255 + Q1256 + Q1257 + Q1258 + Q1259 + Q1260 + Q1261 + Q1262 + Q1263 + Q1264 + Q1265 + Q1266 + Q1267 + Q1268 + Q1269 + Q1270 + Q1271 + Q1272 + Q1273 + Q1274 + Q1275 + Q1276 + Q1277 + Q1278 + Q1279 + Q1280 + Q1281 + Q1282 + Q1283 + Q1284 + Q1285 + Q1286 + Q1287 + Q1288 + Q1289 + Q1290 + Q1291 + Q1292 + Q1293 + Q1294 + Q1295 + Q1296 + Q1297 + Q1298 + Q1299 + Q1300 + Q1301 + Q1302 + Q1303 + Q1304 + Q1305 + Q1306 + Q1307 + Q1308 + Q1309 + Q1310 + Q1311 + Q1312 + Q1313 + Q1314 + Q1315 + Q1316 + Q1317 + Q1318 + Q1319 + Q1320 + Q1321 + Q1322 + Q1323 + Q1324 + Q1325 + Q1326 + Q1327 + Q1328 + Q1329 + Q1330 + Q1331 + Q1332 + Q1333 + Q1334 + Q1335 + Q1336 + Q1337 + Q1338 + Q1339 + Q1340 + Q1341 + Q1342 + Q1343 + Q1344 + Q1345 + Q1346 + Q1347 + Q1348 + Q1349 + Q1350 + Q1351 + Q1352 + Q1353 + Q1354 + Q1355 + Q1356 + Q1357 + Q1358 + Q1359 + Q1360 + Q1361 + Q1362 + Q1363 + Q1364 + Q1365 + Q1366 + Q1367 + Q1368 + Q1369 + Q1370 + Q1371 + Q1372 + Q1373 + Q1374 + Q1375 + Q1376 + Q1377 + Q1378 + Q1379 + Q1380 + Q1381 + Q1382 + Q1383 + Q1384 + Q1385 + Q1386 + Q1387 + Q1388 + Q1389 + Q1390 + Q1391 + Q1392 + Q1393 + Q1394 + Q1395 + Q1396 + Q1397 + Q1398 + Q1399 + Q1400 + Q1401 + Q1402 + Q1403 + Q1404 + Q1405 + Q1406 + Q1407 + Q1408 + Q1409 + Q1410 + Q1411 + Q1412 + Q1413 + Q1414 + Q1415 + Q1416 + Q1417 + Q1418 + Q1419 + Q1420 + Q1421 + Q1422 + Q1423 + Q1424 + Q1425 + Q1426 + Q1427 + Q1428 + Q1429 + Q1430 + Q1431 + Q1432 + Q1433 + Q1434 + Q1435 + Q1436 + Q1437 + Q1438 + Q1439 + Q1440 + Q1441 + Q1442 + Q1443 + Q1444 + Q1445 + Q1446 + Q1447 + Q1448 + Q1449 + Q1450 + Q1451 + Q1452 + Q1453 + Q1454 + Q1455 + Q1456 + Q1457 + Q1458 + Q1459 + Q1460 + Q1461 + Q1462 + Q1463 + Q1464 + Q1465 + Q1466 + Q1467 + Q1468 + Q1469 + Q1470 + Q1471 + Q1472 + Q1473 + Q1474 + Q1475 + Q1476 + Q1477 + Q1478 + Q1479 + Q1480 + Q1481 + Q1482 + Q1483 + Q1484 + Q1485 + Q1486 + Q1487 + Q1488 + Q1489 + Q1490 + Q1491 + Q1492 + Q1493 + Q1494 + Q1495 + Q1496 + Q1497 + Q1498 + Q1499 + Q1500 + Q1501 + Q1502 + Q1503 + Q1504 + Q1505 + Q1506 + Q1507 + Q1508 + Q1509 + Q1510 + Q1511 + Q1512 + Q1513 + Q1514 + Q1515 + Q1516 + Q1517 + Q1518 + Q1519 + Q1520 + Q1521 + Q1522 + Q1523 + Q1524 + Q1525 + Q1526 + Q1527 + Q1528 + Q1529 + Q1530 + Q1531 + Q1532 + Q1533 + Q1534 + Q1535 + Q1536 + Q1537 + Q1538 + Q1539 + Q1540 + Q1541 + Q1542 + Q1543 + Q1544 + Q1545 + Q1546 + Q1547 + Q1548 + Q1549 + Q1550 + Q1551 + Q1552 + Q1553 + Q1554 + Q1555 + Q1556 + Q1557 + Q1558 + Q1559 + Q1560 + Q1561 + Q1562 + Q1563 + Q1564 + Q1565 + Q1566 + Q1567 + Q1568 + Q1569 + Q1570 + Q1571 + Q1572 + Q1573 + Q1574 + Q1575 + Q1576 + Q1577 + Q1578 + Q1579 + Q1580 + Q1581 + Q1582 + Q1583 + Q1584 + Q1585 + Q1586 + Q1587 + Q1588 + Q1589 + Q1590 + Q1591 + Q1592 + Q1593 + Q1594 + Q1595 + Q1596 + Q1597 + Q1598 + Q1599 + Q1600 + Q1601 + Q1602 + Q1603 + Q1604 + Q1605 + Q1606 + Q1607 + Q1608 + Q1609 + Q1610 + Q1611 + Q1612 + Q1613 + Q1614 + Q1615 + Q1616 + Q1617 + Q1618 + Q1619 + Q1620 + Q1621 + Q1622 + Q1623 + Q1624 + Q1625 + Q1626 + Q1627 + Q1628 + Q1629 + Q1630 + Q1631 + Q1632 + Q1633 + Q1634 + Q1635 + Q1636 + Q1637 + Q1638 + Q1639 + Q1640 + Q1641 + Q1642 + Q1643 + Q1644 + Q1645 + Q1646 + Q1647 + Q1648 + Q1649 + Q1650 + Q1651 + Q1652 + Q1653 + Q1654 + Q1655 + Q1656 + Q1657 + Q1658 + Q1659 + Q1660 + Q1661 + Q1662 + Q1663 + Q1664 + Q1665 + Q1666 + Q1667 + Q1668 + Q1669 + Q1670 + Q1671 + Q1672 + Q1673 + Q1674 + Q1675 + Q1676 + Q1677 + Q1678 + Q1679 + Q1680 + Q1681 + Q1682 + Q1683 + Q1684 + Q1685 + Q1686 + Q1687 + Q1688 + Q1689 + Q1690 + Q1691 + Q1692 + Q1693 + Q1694 + Q1695 + Q1696 + Q1697 + Q1698 + Q1699 + Q1700 + Q1701 + Q1702 + Q1703 + Q1704 + Q1705 + Q1706 + Q1707 + Q1708 + Q1709 + Q1710 + Q1711 + Q1712 + Q1713 + Q1714 + Q1715 + Q1716 + Q1717 + Q1718 + Q1719 + Q1720 + Q1721 + Q1722 + Q1723 + Q1724 + Q1725 + Q1726 + Q1727 + Q1728 + Q1729 + Q1730 + Q1731 + Q1732 + Q1733 + Q1734 + Q1735 + Q1736 + Q1737 + Q1738 + Q1739 + Q1740 + Q1741 + Q1742 + Q1743 + Q1744 + Q1745 + Q1746 + Q1747 + Q1748 + Q1749 + Q1750 + Q1751 + Q1752 + Q1753 + Q1754 + Q1755 + Q1756 + Q1757 + Q1758 + Q1759 + Q1760 + Q1761 + Q1762 + Q1763 + Q1764 + Q1765 + Q1766 + Q1767 + Q1768 + Q1769 + Q1770 + Q1771 + Q1772 + Q1773 + Q1774 + Q1775 + Q1776 + Q1777 + Q1778 + Q1779 + Q1780 + Q1781 + Q1782 + Q1783 + Q1784 + Q1785 + Q1786 + Q1787 + Q1788 + Q1789 + Q1790 + Q1791 + Q1792 + Q1793 + Q1794 + Q1795 + Q1796 + Q1797 + Q1798 + Q1799 + Q1800 + Q1801 + Q1802 + Q1803 + Q1804 + Q1805 + Q1806 + Q1807 + Q1808 + Q1809 + Q1810 + Q1811 + Q1812 + Q1813 + Q1814 + Q1815 + Q1816 + Q1817 + Q1818 + Q1819 + Q1820 + Q1821 + Q1822 + Q1823 + Q1824 + Q1825 + Q1826 + Q1827 + Q1828 + Q1829 + Q1830 + Q1831 + Q1832 + Q1833 + Q1834 + Q1835 + Q1836 + Q1837 + Q1838 + Q1839 + Q1840 + Q1841 + Q1842 + Q1843 + Q1844 + Q1845 + Q1846 + Q1847 + Q1848 + Q1849 + Q1850 + Q1851 + Q1852 + Q1853 + Q1854 + Q1855 + Q1856 + Q1857 + Q1858 + Q1859 + Q1860 + Q1861 + Q1862 + Q1863 + Q1864 + Q1865 + Q1866 + Q1867 + Q1868 + Q1869 + Q1870 + Q1871 + Q1872 + Q1873 + Q1874 + Q1875 + Q1876 + Q1877 + Q1878 + Q1879 + Q1880 + Q1881 + Q1882 + Q1883 + Q1884 + Q1885 + Q1886 + Q1887 + Q1888 + Q1889 + Q1890 + Q1891 + Q1892 + Q1893 + Q1894 + Q1895 + Q1896 + Q1897 + Q1898 + Q1899 + Q1900 + Q1901 + Q1902 + Q1903 + Q1904 + Q1905 + Q1906 + Q1907 + Q1908 + Q1909 + Q1910 + Q1911 + Q1912 + Q1913 + Q1914 + Q1915 + Q1916 + Q1917 + Q1918 + Q1919 + Q1920 + Q1921 + Q1922 + Q1923 + Q1924 + Q1925 + Q1926 + Q1927 + Q1928 + Q1929 + Q1930 + Q1931 + Q1932 + Q1933 + Q1934 + Q1935 + Q1936 + Q1937 + Q1938 + Q1939 + Q1940 + Q1941 + Q1942 + Q1943 + Q1944 + Q1945 + Q1946 + Q1947 + Q1948 + Q1949 + Q1950 + Q1951 + Q1952 + Q1953 + Q1954 + Q1955 + Q1956 + Q1957 + Q1958 + Q1959 + Q1960 + Q1961 + Q1962 + Q1963 + Q1964 + Q1965 + Q1966 + Q1967 + Q1968 + Q1969 + Q1970 + Q1971 + Q1972 + Q1973 + Q1974 + Q1975 + Q1976 + Q1977 + Q1978 + Q1979 + Q1980 + Q1981 + Q1982 + Q1983 + Q1984 + Q1985 + Q1986 + Q1987 + Q1988 + Q1989 + Q1990 + Q1991 + Q1992 + Q1993 + Q1994 + Q1995 + Q1996 + Q1997 + Q1998 + Q1999 + Q2000 + Q2001 + Q2002 + Q2003 + Q2004 + Q2005 + Q2006 + Q20

Enter with Runway Rating  
= 46 from column 14c,  
Table 2-5 on page C-43

Parallel line to percent  
operations: Class I =  
100% from column 13,  
Table 2-5.

Proceed vertically at  
Operating Mix Percent  
Landings = 57, from  
Column 12, Table 2-5.

Read  $(HMC)_E$  = 48 at inter-  
section of lines.

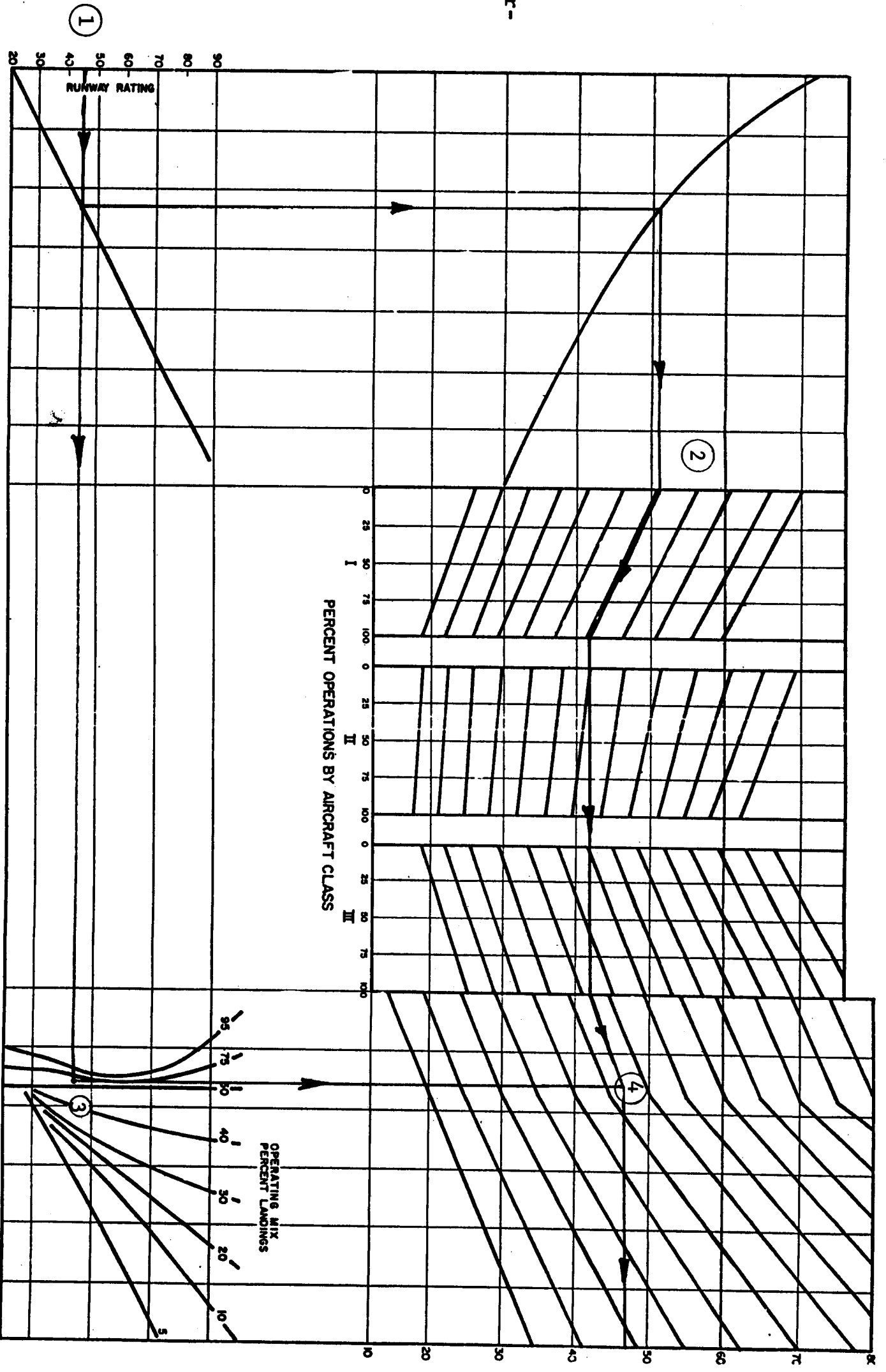


Figure 2-2/EXAMPLE 1



Step No.	①		②	③	④	⑤	⑥	⑦
Procedure	From Field Survey or Forecast		Constants	①×②	③ <sub>S</sub> ÷ ③ <sub>G</sub>	Constants	④ <sub>S</sub> × ⑤	⑥ <sub>G</sub> × ⑦ <sub>G</sub>
Step Definition	Takeoff Demand		Equivalent Movement Factors	Takeoff Equivalent Movements	Class Distribution	Class HDC's	Weighted (HDC) <sub>E</sub>	Weighted (HDC) <sub>A</sub>
	Type Operation	No. of Aircraft						

Aircraft Class I

Single	300	1.00	300
FORMATION of	2	100	.60
	3	-	.47
	4	100	.40
Pairs	-	.50	-

Sub-Totals I

\$ 500	\$ 400	\$ .67	49	\$ 33
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Aircraft Class II

Single	200	1.00	200
FORMATION of	2		.63
	3		.51
	4		.45
Pairs		.50	

Sub-Totals II

\$ 200	\$ 200	\$ .33	63	\$ 21
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Aircraft Class III

Single		1.00	
FORMATION of	2		.69
	3		.59
	4		.54
Pairs		.50	

Sub-Totals III

\$	\$	\$	90	\$
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ALL CLASSES } Grand-Totals

① <sub>G</sub> 700	③ <sub>G</sub> 600	④ <sub>G</sub> 1.0	90	⑥ <sub>G</sub> 54	63
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Table 2-3/EXAMPLE 2  
VFR HOURLY DEPARTURE CAPACITY (HDC) ANALYSIS WORK SHEET



Table 2-1/Example 2

HAC - HOURLY ARRIVAL CAPACITY - Movements Per Hour

Aircraft Class	Runway Rating					
	30	40	50	60	70	80
I	50	47	(44)	(40)	35	30
II	57	(52)	(47)	42	38	33
III	63	62	58	53	47	41

Class I: Interpolate between 44 & 40; Use 42.

Class II: Interpolate between 52 & 47; Use 51.

Table 2-2/Example 2

EQUIVALENT MOVEMENT FACTORS  
For Touch & Go or Landings in Formation

Landing Procedure	HAC - Movements per Hour							
	30	35	(40)	(45)	50	55	60	65
Formation of 2	.58	.59	.61	.62	.64	.65	.67	.68
Formation of 3	.45	.47	.49	.50	.52	.55	.56	.57
Formation of 4	.37	.40	.42	.44	.46	.48	.50	.52
Touch and Go	.17	.20	.23	.25	.27	.30	.33	.37

Class I: Interpolate between 40 & 45; Use .61/.49\*/.43/.24

Class II: Values not needed in this example.

\*Value not needed in this example.



1 Enter with Runway Ratings = 46 from column 14C, Table 2-5 on page C-43

2 Parallel line to Percent Operations: Class I = 82 Class II = 18 from Column 13, Table 2-5.

3 Proceed vertically at Operating Mix Percent Landings = 55, from Column 12, Table 2-5.

4 Read (HMC)<sub>E</sub> = 47 at intersection of lines.

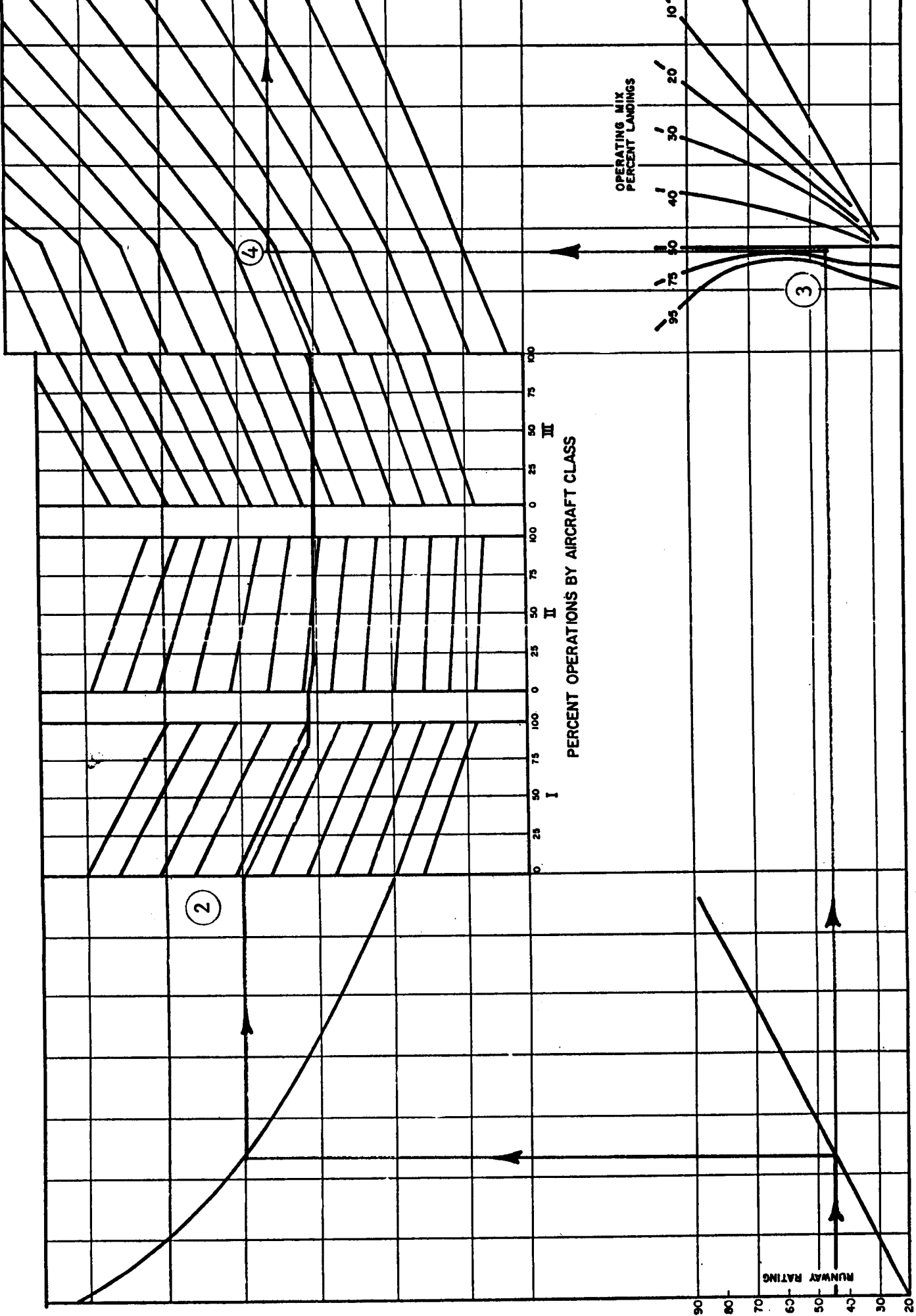


Figure 2-2/EXAMPLE 2  
VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

- c. IFR Capacity. IFR runway capacities are computed using Tables 2-6 and 2-7. A series of examples follow indicating the use of these tables, which are reproduced here for convenience.

Examples.

- (1) Compute the IFR capacity of:

Layout	Single Runway
Type Navaid	Conventional
Airspace	Unrestricted
Radar	Yes
Aircraft Class	III
Ratio (Arrivals/ Departures)	1.0
Runway Rating	60

Refer Table 2-6 (Example) on page C-53; Capacity = 32 operations/hour.

- (2) Compute the IFR capacity of

Layout	Single Runway
Type Navaid	PAR (1)
Airspace	Unrestricted
Radar	Yes
Aircraft Class	II
Ratio (Arrivals/ Departures)	1.2
Runway Rating	90

Refer Table 2-6 (Example) on page C-54; Capacity = 29 operations/hour.

(3) Compute the IFR capacity of:

Layout	Single Runway
Type Navaid	Conventional
Airspace	Restricted
Radar	No
Aircraft Class	III
Ratio (Arrivals/ Departures)	1.0
Runway Rating	75

Refer to Table 2-6 (Example) on page C-55; Capacity = 16 operations/hour.

(4) Compute the IFR capacity of:

Layout	Close Parallels - Dependent
Type Navaid	PAR (2)
Airspace	Unrestricted
Radar	Yes
Aircraft Class	50% I      50% III
Ratio (Arrivals/ Departures)	1.0
Runway Rating	75

Refer to Table 2-7 (Example) on page C-56;  
Capacity = 46 operations/hour (Class I)  
Capacity = 44 operations/hour (Class II)  
Average =  $(0.5 \times 46) + (0.5 \times 44) = 45$

(5) Compute the IFR capacity of:

Layout	Parallels - Dependent
Type Navaid	PAR (1)
Airspace	Restricted
Radar	Yes
Aircraft Class	I
Ratio (Arrivals/ Departures)	1.5
Runway Rating	60

Refer to Table 2-7 (Example) on page C-57;  
Capacity = 25 operations/hour.

(6) Compute the IFR capacity of:

Layout	Single Runway
Type Navaid	PAR (1)
Airspace	Restricted
Radar	Yes
Aircraft Class	30% I; 50% II, 20% III
Ratio (Arrivals/ Departures)	1.0
Runway Rating	I @ 60; II @ 90; III @ 30

Refer to Table 2-6 (Example) on page C-58;  
Capacity: Class I = 22; II = 20; III = 26

Weighted Capacity = Sum of each class capacity times  
percent class distribution

$$\begin{aligned} &= (22 \times 0.30) + (20 \times 0.50) + (26 \times 0.20) \\ &= 6.6 + 10 + 5.2 \\ &= 21.8 \text{ (Use 21)*} \end{aligned}$$

\* Always drop fractional values.



Table 2-6 (Example 1)

IFR CAPACITY (SINGLE RUNWAY)

Type Navaid	Radar										Non-Radar			
	PAR (1)					PAR (2) & Conventional					Conventional			
Runway Rating	30		60			90		30		60		90		All Rating
Aircraft Class	I&II	III	I&II	III	I&II	III	I&II	III	I&II	III	I&II	III	All Classes	
Ratio														

(UNRESTRICTED AIRSPACE)

.2	46	46	43	43	41	41	46	46	43	43	41	41	28
.4	42	42	36	36	34	34	42	42	36	36	34	34	25
.6	42	42	37	37	32	32	42	42	37	37	32	32	21
.8	40	34	34	34	29	29	40	40	34	34	29	29	18
1.0	38	30	32	30	30	30	38	38	32	32	30	30	16
1.2	37	28	33	28	29	28	39	39	33	33	29	29	15
1.5	33	25	33	25	30	25	40	25	33	25	33	33	13
2.0	30	23	30	23	30	23	40	33	33	33	30	30	12
3.0	27	20	27	20	27	20	40	29	33	29	29	29	11
4.0	27	20	27	20	27	20	37	27	35	27	31	27	10

(RESTRICTED AIRSPACE)

.2	30	30	24	24	24	24	30	30	24	24	24	24	28
.4	28	28	21	21	21	21	28	28	21	21	21	21	25
.6	24	24	21	21	21	21	24	24	21	21	21	21	21
.8	24	24	22	22	22	22	24	24	22	22	22	22	18
1.0	26	26	22	22	20	20	26	26	22	22	20	20	16
1.2	26	26	22	22	20	20	26	26	22	22	20	20	15
1.5	26	25	23	23	21	21	26	26	23	23	21	21	13
2.0	27	23	23	23	21	21	27	27	23	23	21	21	12
3.0	27	20	24	20	20	26	28	28	24	24	21	21	11
4.0	25	19	25	19	22	19	30	27	25	25	23	23	10

- PAR (1) - PAR with single approach capability
- PAR (2) - PAR with multiple approach capability
- Conventional - Conventional navaid (VOR, TACAN, NDE)
- I, II, III - Indicates applicable aircraft class
- Unrestricted Airspace - More than one departure path capability
- Restricted Airspace - Single departure path capability
- Ratio =  $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

Table 2-6 (Example 2)

IFR CAPACITY (SINGLE RUNWAY)

Type Navaid	Radar											Non-Radar	
	PAR (1)				PAR (2) & Conventional							Conventional	
Runway Rating	30		60		90		30		60		90		All Rating
Aircraft Class	I&II	III	I&II	III	I&II	III	I&II	III	I&II	III	I&II	III	All Classes
Ratio													

(UNRESTRICTED AIRSPACE)

.2	46	46	43	43	41	41	46	46	43	43	41	41	28
.4	42	42	36	36	34	34	42	42	36	36	34	34	25
.6	42	42	37	37	32	32	42	42	37	37	32	32	21
.8	40	34	34	34	29	29	40	40	34	34	29	29	18
1.0	38	30	32	30	30	30	38	38	32	32	30	30	16
1.2	37	28	33	28	29	28	39	39	33	33	29	29	15
1.5	33	25	33	25	30	25	40	25	33	25	33	33	13
2.0	30	23	30	23	30	23	40	33	33	33	30	30	12
3.0	27	20	27	20	27	20	40	29	33	29	29	29	11
4.0	27	20	27	20	27	20	37	27	35	27	31	27	10

(RESTRICTED AIRSPACE)

.2	30	30	24	24	24	24	30	30	24	24	24	24	28
.4	28	28	21	21	21	21	28	28	21	21	21	21	25
.6	24	24	21	21	21	21	24	24	21	21	21	21	21
.8	24	24	22	22	22	22	24	24	22	22	22	22	18
1.0	26	26	22	22	20	20	26	26	22	22	20	20	16
1.2	26	26	22	22	20	20	26	26	22	22	20	20	15
1.5	26	25	23	23	21	21	26	26	23	23	21	21	13
2.0	27	23	23	23	21	21	27	27	23	23	21	21	12
3.0	27	20	24	20	20	26	28	28	24	24	21	21	11
4.0	25	19	25	19	22	19	30	27	25	25	23	23	10

- PAR (1) - PAR with single approach capability
- PAR (2) - PAR with multiple approach capability
- Conventional - Conventional navaid (VOR, TACAN, NDE)
- I, II, III - Indicates applicable aircraft class
- Unrestricted Airspace - More than one departure path capability
- Restricted Airspace - Single departure path capability
- Ratio =  $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

Table 2-6 (Example 3)

IFR CAPACITY (SINGLE RUNWAY)

Type Navaid	Radar												Non-Radar
	PAR (1)						PAR (2) & Conventional						Conventional
	30		60		90		30		60		90		All Rating
Runway Rating	I&II	III	I&II	III	I&II	III	I&II	III	I&II	III	I&II	III	All Classes
Aircraft Class													All Classes
Ratio													

(UNRESTRICTED AIRSPACE)

.2	46	46	43	43	41	41	46	46	43	43	41	41	28
.4	42	42	36	36	34	34	42	42	36	36	34	34	25
.6	42	42	37	37	32	32	42	42	37	37	32	32	21
.8	40	34	34	34	29	29	40	40	34	34	29	29	18
1.0	38	30	32	30	30	30	38	38	32	32	30	30	16
1.2	37	28	33	28	29	28	39	39	33	33	29	29	15
1.5	33	25	33	25	30	25	40	25	33	25	33	33	13
2.0	30	23	30	23	30	23	40	33	33	33	30	30	12
3.0	27	20	27	20	27	20	40	29	33	29	29	29	11
4.0	27	20	27	20	27	20	37	27	35	27	31	27	10

(RESTRICTED AIRSPACE)

.2	30	30	24	24	24	24	30	30	24	24	24	24	28
.4	28	28	21	21	21	21	28	28	21	21	21	21	25
.6	24	24	21	21	21	21	24	24	21	21	21	21	21
.8	24	24	22	22	22	22	24	24	22	22	22	22	18
1.0	26	26	22	22	20	20	26	26	22	22	20	20	16
1.2	26	26	22	22	20	20	26	26	22	22	20	20	15
1.5	26	25	23	23	21	21	26	26	23	23	21	21	13
2.0	27	23	23	23	21	21	27	27	23	23	21	21	12
3.0	27	20	24	20	20	26	28	28	24	24	21	21	11
4.0	25	19	25	19	22	19	30	27	25	25	23	23	10

- PAR (1) - PAR with single approach capability
- PAR (2) - PAR with multiple approach capability
- Conventional - Conventional navaid (VOR, TACAN, NDE)
- I, II, III - Indicates applicable aircraft class
- Unrestricted Airspace - More than one departure path capability
- Restricted Airspace - Single departure path capability
- Ratio =  $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

Table 2-7 (Example 4)

IFR CAPACITIES (PARALLEL RUNWAYS)

Type Navaid	Radar						Non-Radar Con.							
	PAR (1)			PAR (2) & Conventional			All Ratings							
Runway Rating	All Ratings			All Ratings			All Classes							
Aircraft Class	I	II	III	I	II	III	All Classes							
Ratio	(UNRESTRICTED AIRSPACE)													
	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.
.2	54	59	54	72	54	72	54	59	54	72	54	72	28	36
.4	45	69	45	70	45	53	45	69	45	84	45	77	25	28
.6	45	53	45	53	40	40	45	79	45	80	45	59	21	21
.8	45	45	45	45	34	34	45	68	45	67	45	50	18	18
1.0	40	40	40	40	30	30	46	60	46	60	44	44	16	16
1.2	37	37	37	37	27	28	46	55	46	55	40	40	15	15
1.5	33	33	33	33	25	25	45	50	45	50	37	37	13	13
2.0	30	30	30	30	23	23	45	45	45	45	33	33	12	12
3.0	27	27	27	27	20	20	40	40	40	40	29	29	11	11
4.0	25	25	25	25	19	19	38	38	38	38	27	28	10	10

(RESTRICTED AIRSPACE)

	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.
.2	30	36	30	36	30	36	30	36	30	36	30	36	28	36
.4	28	42	28	42	28	42	28	42	28	42	28	42	25	28
.6	27	48	27	48	27	40	27	48	27	48	27	48	21	21
.8	25	45	25	45	25	34	25	54	25	54	25	50	18	18
1.0	26	40	26	40	26	30	26	60	26	60	26	44	16	16
1.2	26	37	26	37	26	28	26	55	26	55	26	40	15	15
1.5	25	33	25	33	25	25	25	50	25	50	25	37	13	13
2.0	25	30	25	30	22	23	25	45	25	45	25	33	12	12
3.0	25	27	25	27	20	20	25	40	25	40	25	29	11	11
4.0	25	25	25	25	19	19	26	38	26	38	26	28	10	10

- PAR (1) - PAR with single approach capability
- PAR (2) - PAR with multiple approach capability
- Con. - Conventional navaid (VOR, TACAN, NDE)
- I, II, III - Indicates applicable aircraft class
- Dep. - Release of departure dependent on assured landing on parallel runway (per ATC criteria)
- Ind. - Release of departure not dependent on assured landing on parallel runway (per ATC criteria)
- Ratio =  $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

Table 2-7 (Example 5)

IFR CAPACITIES (PARALLEL RUNWAYS)

Type Navaid	Radar											Non-Radar		
	PAR (1)						PAR (2) & Conventional					Con.		
Runway Rating	All Ratings						All Ratings					All Ratings		
Aircraft Class	I	II		III		I	II		III		All Classes			
Ratio	(UNRESTRICTED AIRSPACE)													
	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.
.2	54	59	54	72	54	72	54	59	54	72	54	72	28	36
.4	45	69	45	70	45	53	45	69	45	84	45	77	25	28
.6	45	53	45	53	40	40	45	79	45	80	45	59	21	21
.8	45	45	45	45	34	34	45	68	45	67	45	50	18	18
1.0	40	40	40	40	30	30	46	60	46	60	44	44	16	16
1.2	37	37	37	37	27	28	46	55	46	55	40	40	15	15
1.5	33	33	33	33	25	25	45	50	45	50	37	37	13	13
2.0	30	30	30	30	23	23	45	45	45	45	33	33	12	12
3.0	27	27	27	27	20	20	40	40	40	40	29	29	11	11
4.0	25	25	25	25	19	19	38	38	38	38	27	28	10	10

(RESTRICTED AIRSPACE)

	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.	Dep.	Ind.
.2	30	36	30	36	30	36	30	36	30	36	30	36	28	36
.4	28	42	28	42	28	42	28	42	28	42	28	42	25	28
.6	27	48	27	48	27	40	27	48	27	48	27	48	21	21
.8	25	45	25	45	25	34	25	54	25	54	25	50	18	18
1.0	26	40	26	40	26	30	26	60	26	60	26	44	16	16
1.2	26	37	26	37	26	28	26	55	26	55	26	40	15	15
1.5	25	33	25	33	25	25	25	50	25	50	25	37	13	13
2.0	25	30	25	30	22	23	25	45	25	45	25	33	12	12
3.0	25	27	25	27	20	20	25	40	25	40	25	29	11	11
4.0	25	25	25	25	19	19	26	38	26	38	26	28	10	10

- PAR (1) - PAR with single approach capability
- PAR (2) - PAR with multiple approach capability
- Con. - Conventional navaid (VOR, TACAN, NDE)
- I, II, III - Indicates applicable aircraft class
- Dep. - Release of departure dependent on assured landing on parallel runway (per ATC criteria)
- Ind. - Release of departure not dependent on assured landing on parallel runway (per ATC criteria)
- Ratio =  $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

Table 2-6 (Example 6)

IFR CAPACITY (SINGLE RUNWAY)

Type Navaid	Radar												Non-Radar
Runway Rating	PAR (1)						PAR (2) & Conventional						Conventional
Runway Rating	30	60	90	90	60	90	60	90	60	90	90	90	All Rating
Aircraft Class	I&II	III	I&II	III	I&II	III	I&II	III	I&II	III	I&II	III	All Classes
Ratio													

(UNRESTRICTED AIRSPACE)

.2	46	46	43	43	41	41	46	46	43	43	41	41	28
.4	42	42	36	36	34	34	42	42	36	36	34	34	25
.6	42	42	37	37	32	32	42	42	37	37	32	32	21
.8	40	34	34	34	29	29	40	40	34	34	29	29	18
1.0	38	30	32	30	30	30	38	38	32	32	30	30	16
1.2	37	28	33	28	29	28	39	39	33	33	29	29	15
1.5	33	25	33	25	30	25	40	25	33	25	33	33	13
2.0	30	23	30	23	30	23	40	33	33	33	30	30	12
3.0	27	20	27	20	27	20	40	29	33	29	29	29	11
4.0	27	20	27	20	27	20	37	27	35	27	31	27	10

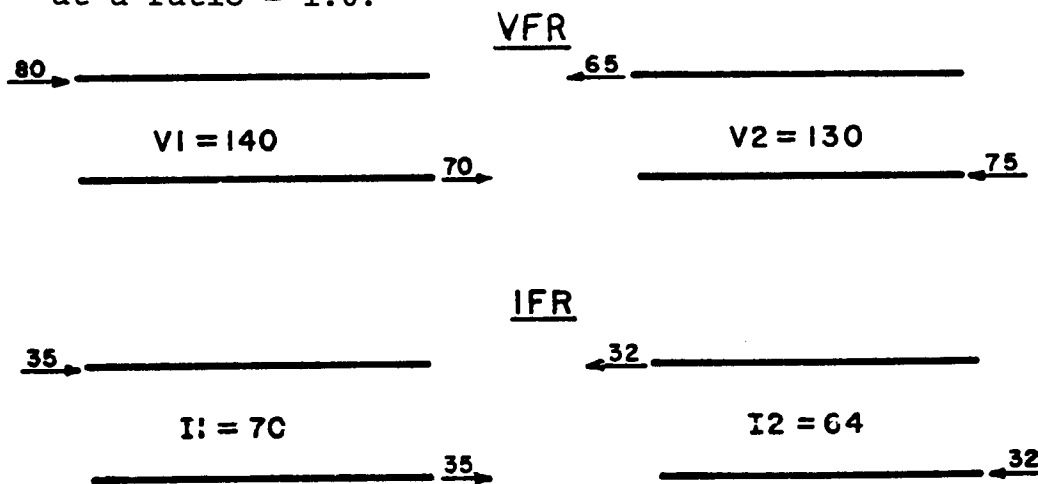
(RESTRICTED AIRSPACE)

.2	30	30	24	24	24	24	30	30	24	24	24	24	28
.4	28	28	21	21	21	21	28	28	21	21	21	21	25
.6	24	24	21	21	21	21	24	24	21	21	21	21	21
.8	24	24	22	22	22	22	24	24	22	22	22	22	18
1.0	26	26	22	22	20	20	26	26	22	22	20	20	16
1.2	26	26	22	22	20	20	26	26	22	22	20	20	15
1.5	26	25	23	23	21	21	26	26	23	23	21	21	13
2.0	27	23	23	23	21	21	27	27	23	23	21	21	12
3.0	27	20	24	20	20	26	28	28	24	24	21	21	11
4.0	25	19	25	19	22	19	30	27	25	25	23	23	10

- PAR (1) - PAR with single approach capability
- PAR (2) - PAR with multiple approach capability
- Conventional - Conventional navaid (VOR, TACAN, NDE)
- I, II, III - Indicates applicable aircraft class
- Unrestricted Airspace - More than one departure path capability
- Restricted Airspace - Single departure path capability
- Ratio =  $\frac{\text{Arrival Demand}}{\text{Departure Demand}}$

d. Daily Capacity. Daily capacity is computed by applying the following steps:

- (1) List all possible operating configurations; for this example assume touch and go traffic is negligible. In other words, the air station is assumed to operate at a ratio = 1.0.



- (2) Estimate the % VFR and IFR weather during the average day. It may also be desirable to calculate the daily capacity on a basis of 100% VFR weather or 100% IFR weather. This example assumes the following:

85% VFR

15% IFR

- (3) Estimate the % use of each operating priority; assumed as follows:

V 1	60%
V 2	25%
I 1	10%
I 2	5%

(4) Calculate a "weighted" average hourly capacity

$$\begin{array}{r r r r}
 140 \times .6 & = & 84.0 & \\
 130 \times .25 & = & 32.5 & \\
 70 \times .10 & = & 7.0 & \\
 64 \times .05 & = & \underline{3.2} & \\
 & & 126.7 & (127)
 \end{array}$$

(5) It is unrealistic to assume that all available hours would be subject to peak hour demand. It can be assumed that the hours of peak demand and hours of slack demand could be identified (or stipulated) for any particular air station. This can be accomplished as follows:

- For each operating hour determine the expected demand level as a decimal percentage of 1.
- Sum these percentages to obtain the hours of utilization.

Assuming the following hourly utilization, the hourly utilization sum = 8.8.

Hour	1	2	3	4	5	6	7	8	9	10	11	12
% of Peak Demand	.3	.8	1	1	.8	.6	.9	1	1	.7	.4	.3

Note: Facility assumed open only 12 hours per day in this example.

- .. Subjectively reduce "hours utilization" to account for periods of time that the runway facilities are not available for aircraft operations; as for example, emergencies, missed approaches, runway maintenance, other non-pilot utilization, etc.



- .. Consider reduction of up to 15% for conventional operation and up to 50% for Carrier Practice Landing Operations - suggested per recommendation of NATRACOM as contained in Technical Report 583, Volume II of IV, prepared by Operations Research, Inc., under contract for the Department of Navy.

In the example, 8.8 hours would reduce to approximately 7.5 hours.

- (6) Multiply the weighted hourly capacity times the total hours of utilization.

$$127 \times 7.5 = 952.5$$

Daily capacity = (953) operations/day

e. Application of Figure 2-2. The following additional examples demonstrate the particular use of Figure 2-2:

- (1) Given: Runway Rating = 65  
Percent Operations by Class: 100% I  
Operating Mix Percent Landings: 30%

Determine  $(HMC)_E$

Answer: 42 (Refer Figure 2-2/EXAMPLE on page C-63)

- (2) Given: Runway Rating = 60  
Percent Operations by Class: 100% II  
Operating Mix Percent Landings: 30%

Determine  $(HMC)_E$

Answer: 51 (Refer Figure 2-2/EXAMPLE on page C-64)

- (3) Given: Runway Rating = 45  
Percent Operations by Class: 100% III  
Operating Mix Percent Landings: 45%

Determine  $(HMC)_E$

Answer: 65 (Refer Figure 2-2/EXAMPLE on page C-65)

- (4) Given: Runway Rating = 60  
Percent Operations by Class: 50% I  
50% III  
Operating Mix Percent Landings: 15%

Determine  $(HMC)_E$

Answer: 55 (Refer Figure 2-2/EXAMPLE on page C-66)

Runway Rating = 65  
 Percent Operations:  
 Class I = 100%  
 Percent Landings = 30%

Answer: (HMC) E = 42

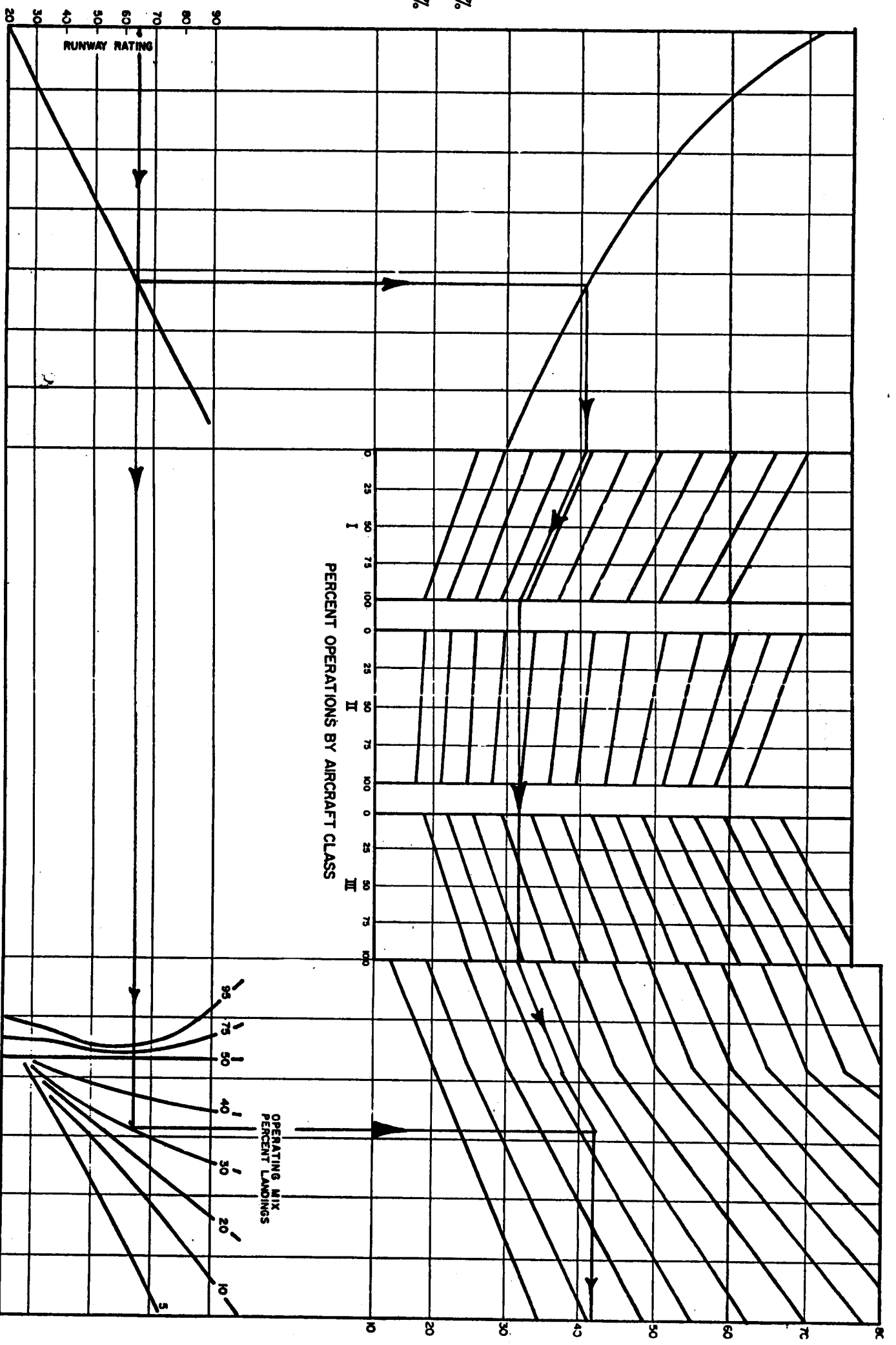


Figure 2-2/EXAMPLE

VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

Given: Runway Rating = 60  
 Percent Operations: Class II = 100%  
 Percent Landings = 30%  
 Answer: (HMC) E = 51

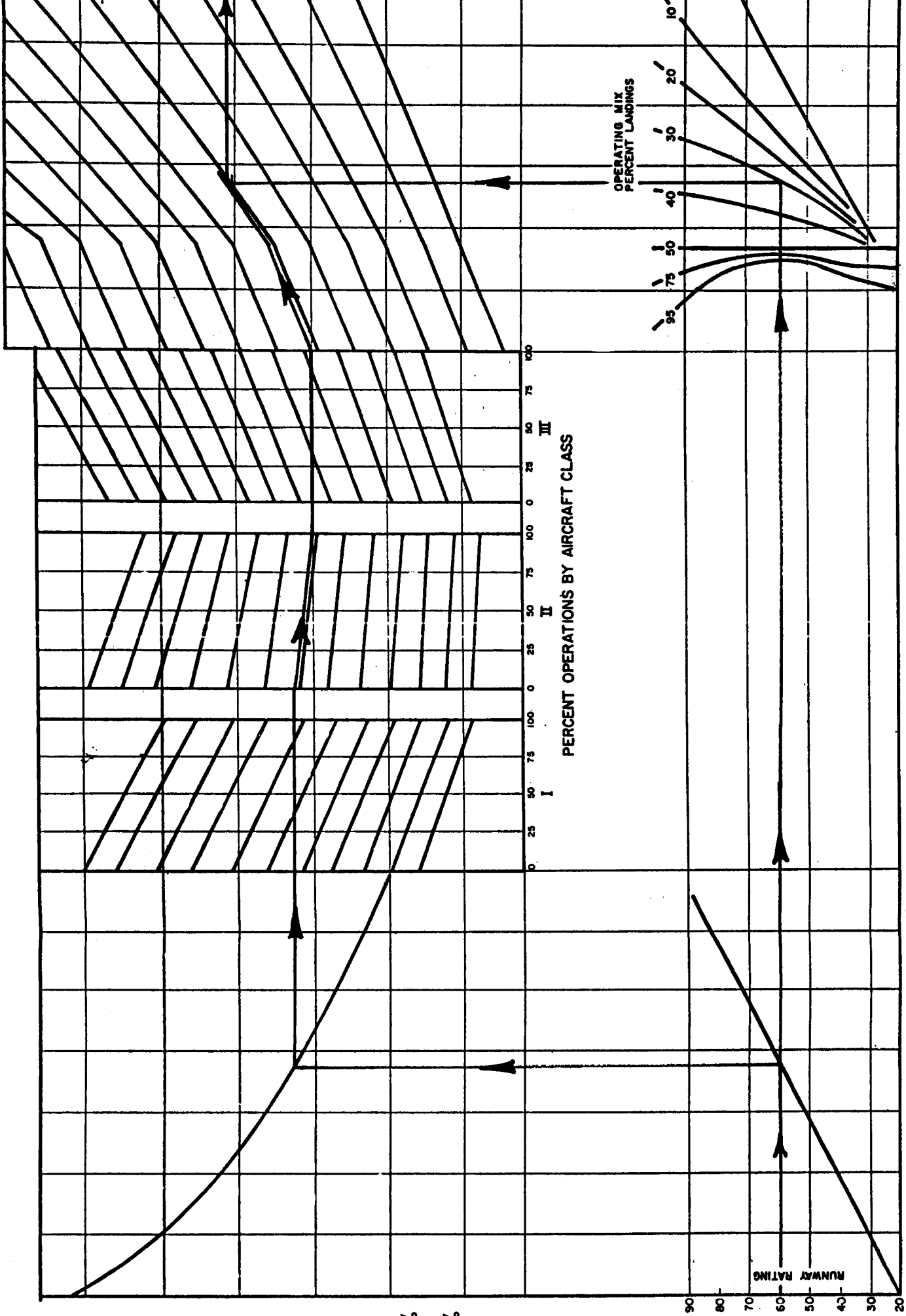


Figure 2-2/EXAMPLE  
 VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

Runway Rating = 45  
 Percent Operations:  
 Class III = 100%  
 Percent Landings = 45%  
 Answer: (HMC) E = 65

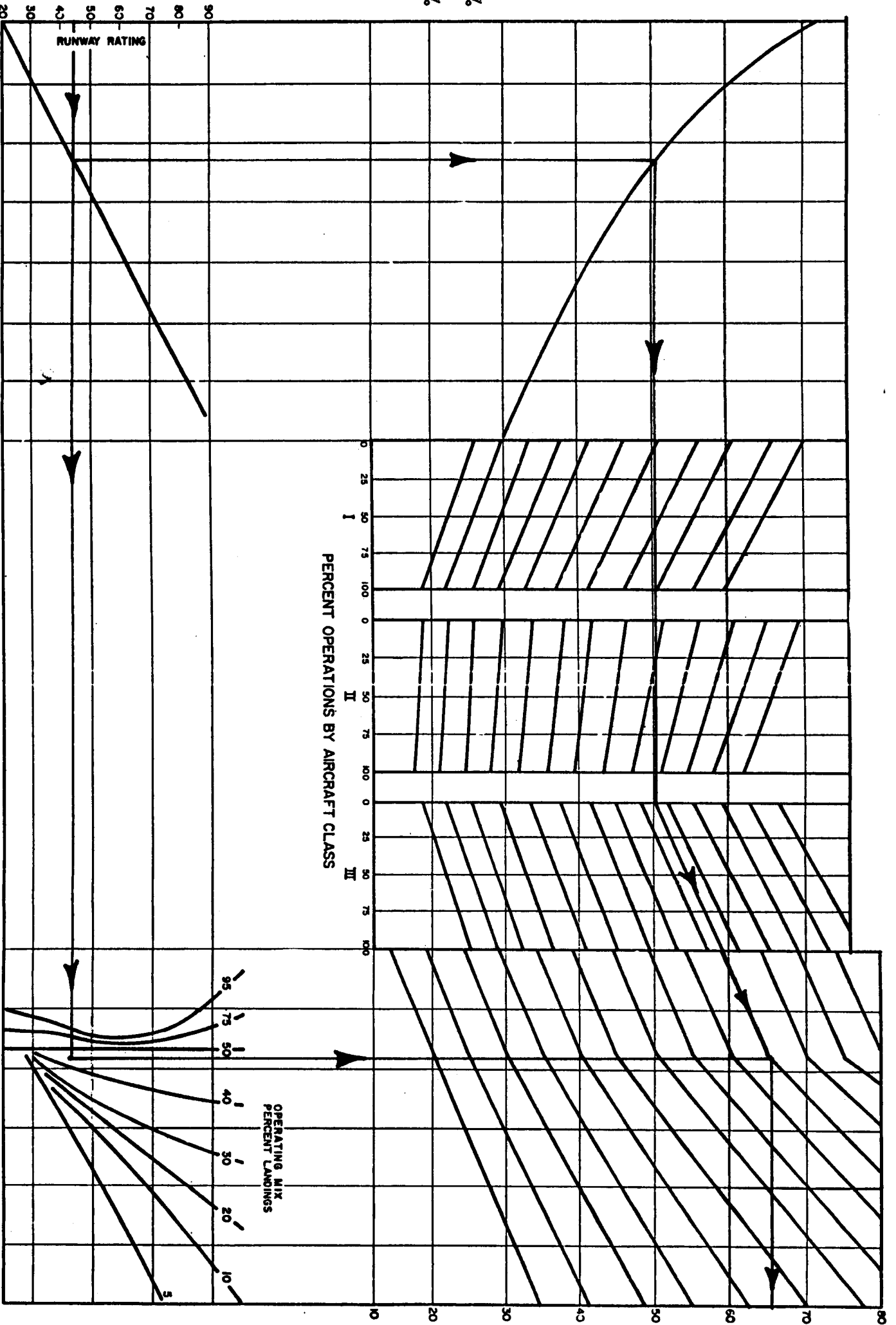


Figure 2-2/EXAMPLE

VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

Runway Rating = 60  
 Percent Operations:  
 Class I = 50%  
 Class III = 50%  
 Percent Landings = 15%  
 Answer: (HMC) E = 55

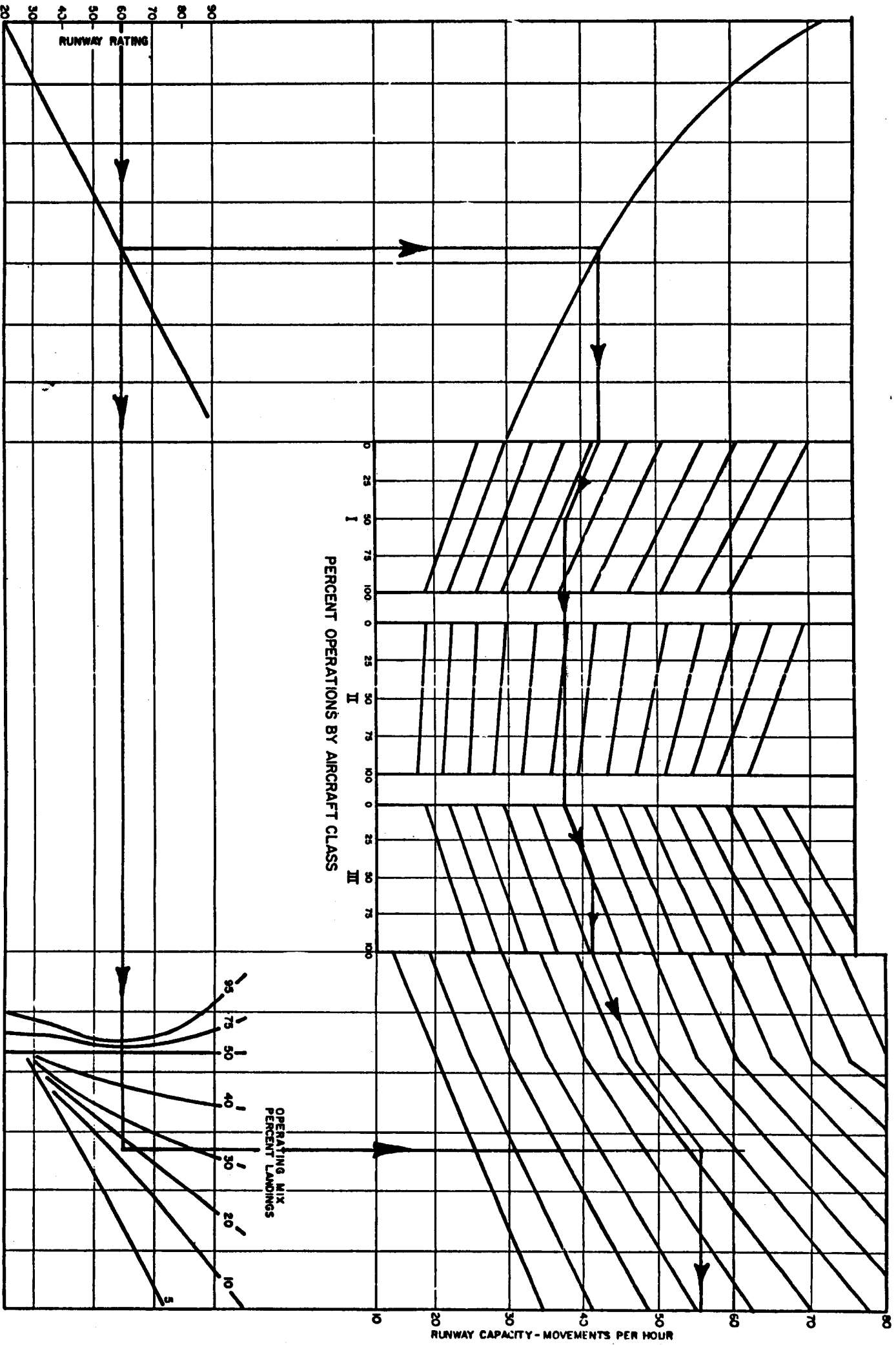


Figure 2-2/EXAMPLE  
 VFR RUNWAY CAPACITY FOR MIXED OPERATIONS

## Section IV. WORK SHEETS

For use in the calculation of runway capacities, extra copies of the following figures and tables are provided:

Figure 2-1: Runway Rating

Figure 2-2: VFR Runway Capacity for Mixed Operations

Table 2-1: HAC - Hourly Arrival Capacity

Table 2-2: Equivalent Movement Factors

Table 2-3: VFR Hourly Departure Capacity (HDC)  
Analysis Work Sheet

Table 2-4: VFR Hourly Arrival Capacity (HAC) Analysis  
Work Sheet

Table 2-5: VFR Hourly Mixed Capacity (HMC) Analysis  
Work Sheet

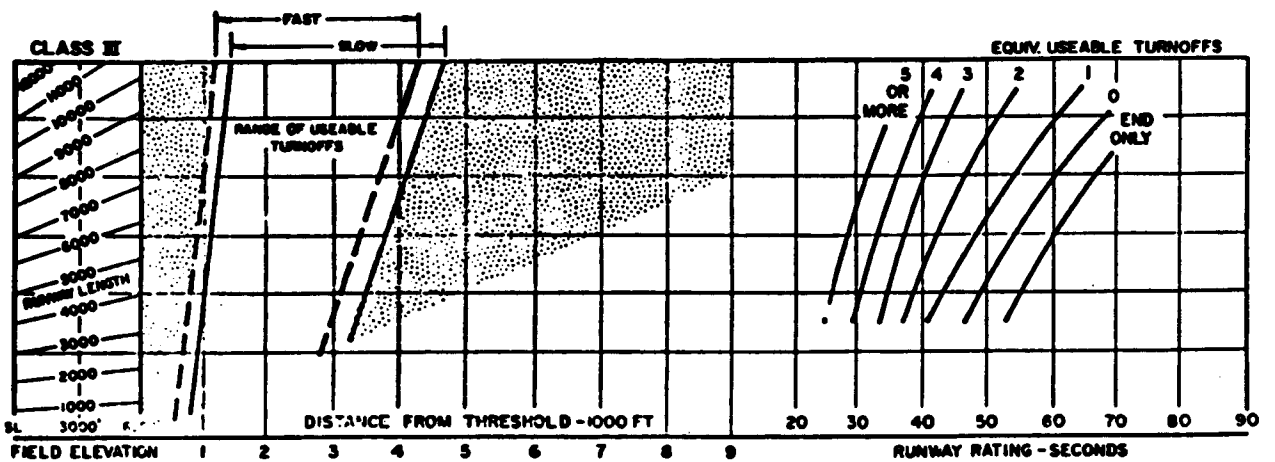
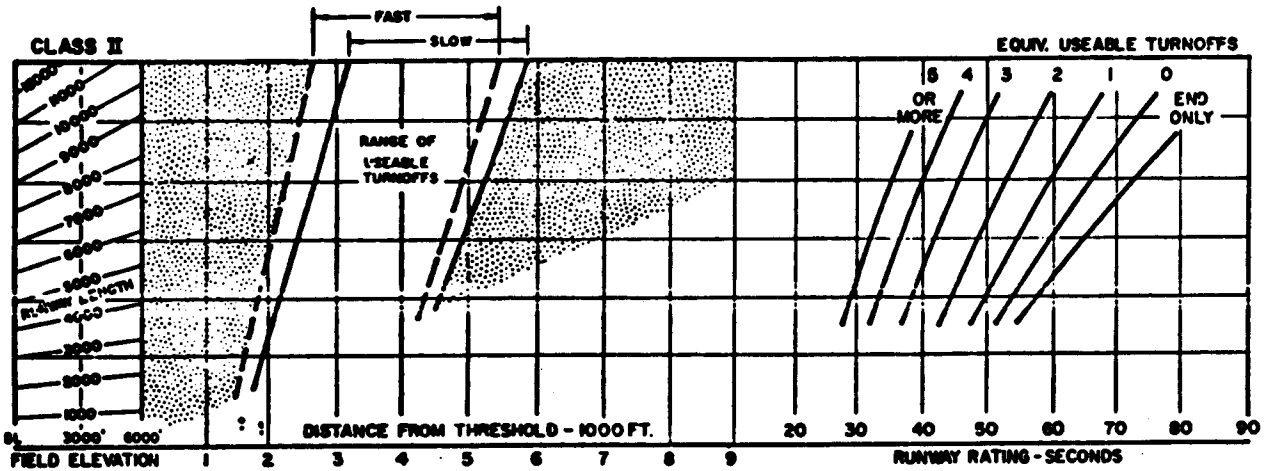
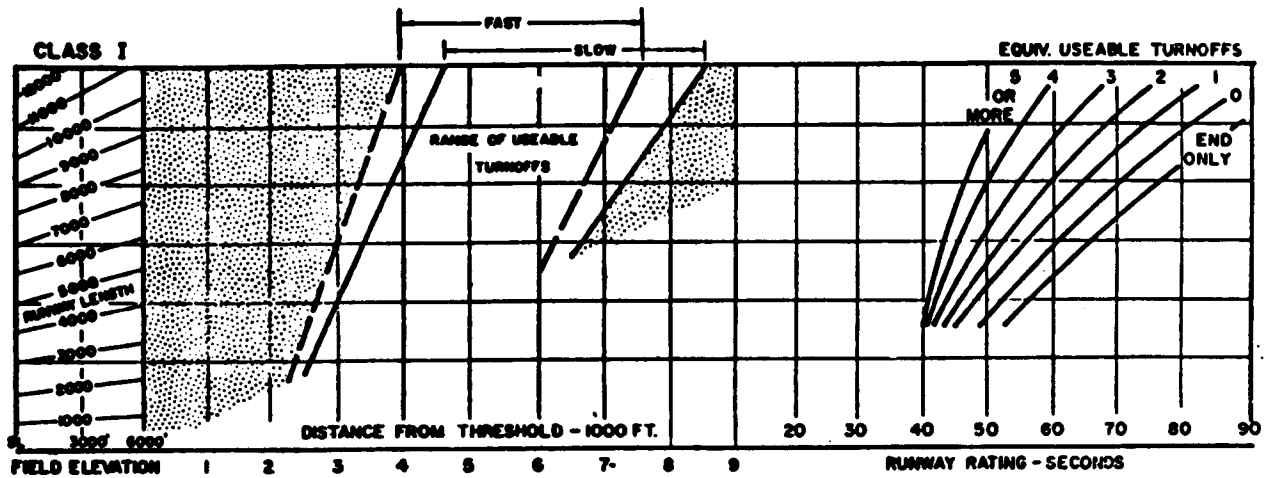


FIGURE 2-1  
**RUNWAY RATING**  
 AVERAGE LANDING OCCUPANCY TIME-SECONDS



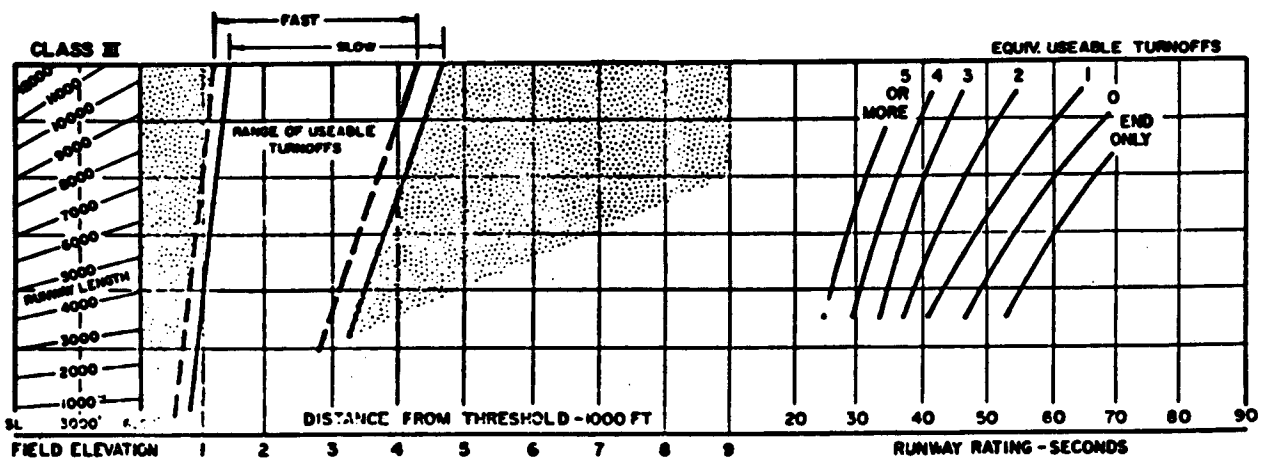
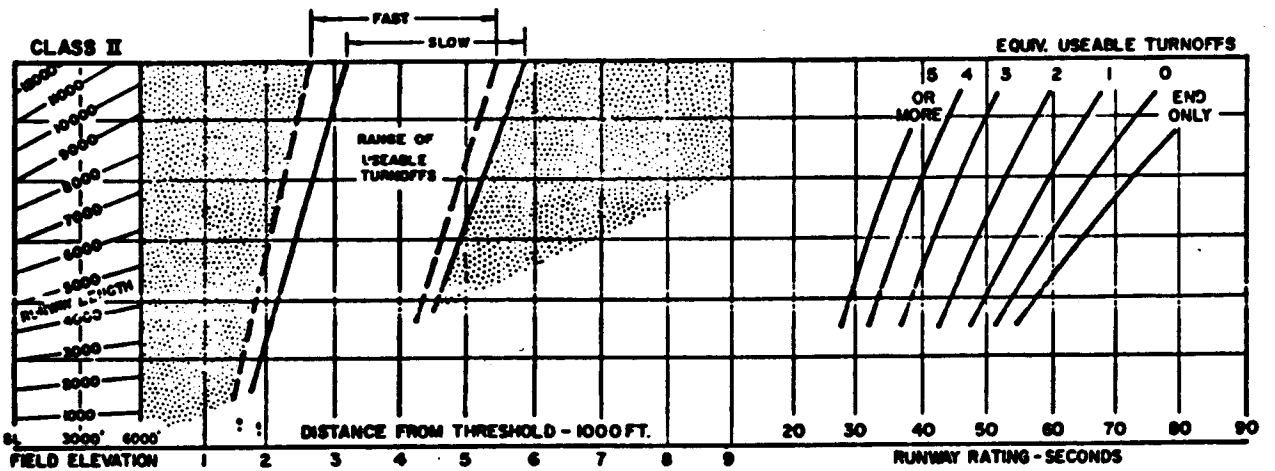
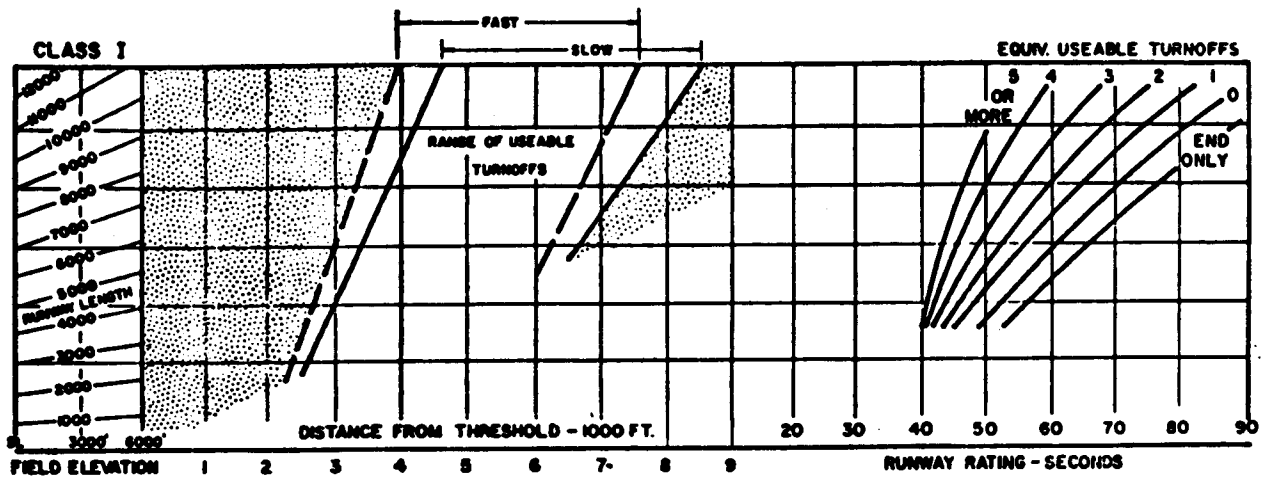


FIGURE 2-1  
**RUNWAY RATING**  
 AVERAGE LANDING OCCUPANCY TIME-SECONDS

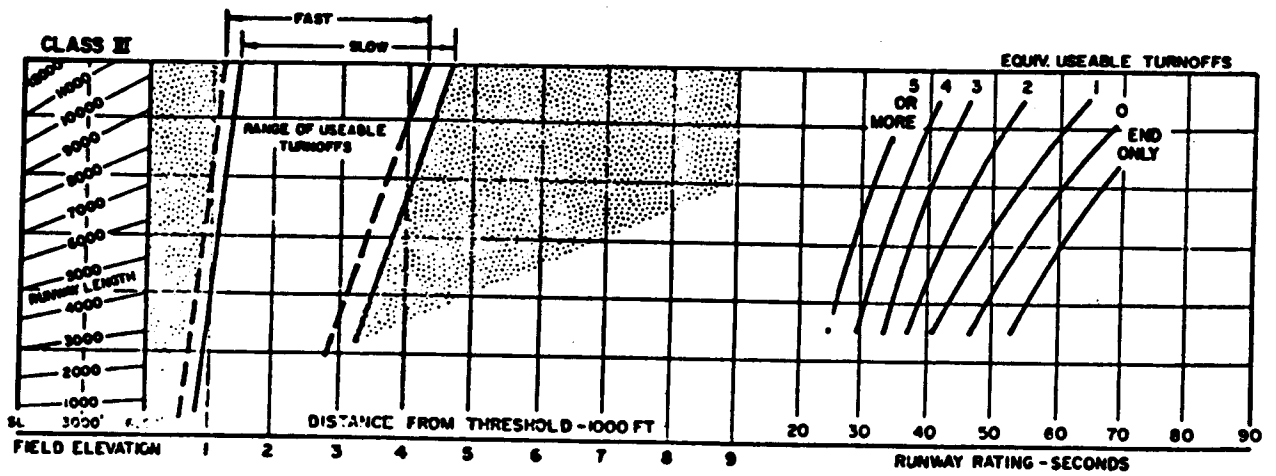
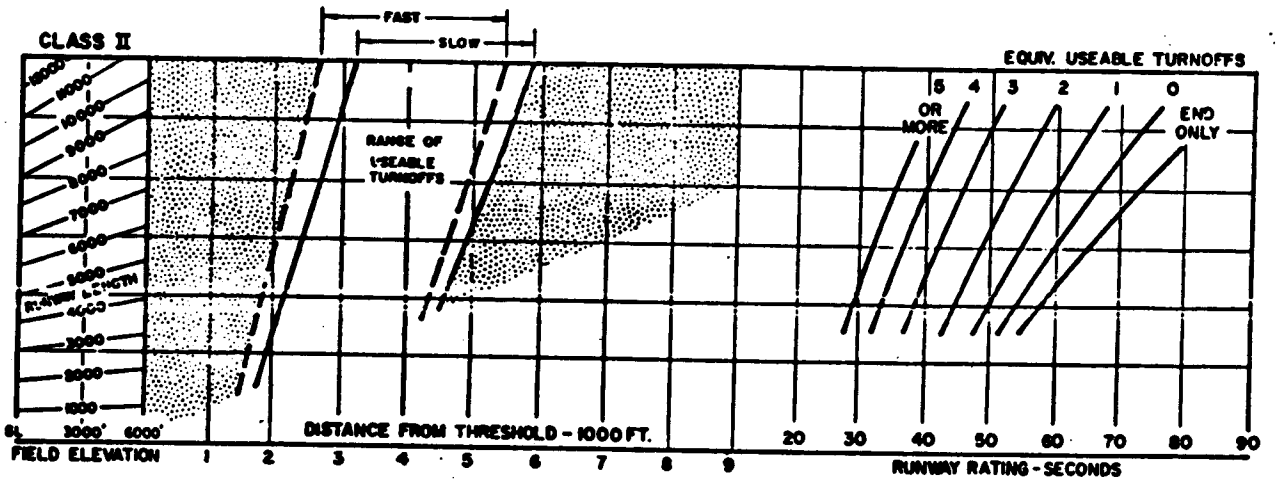
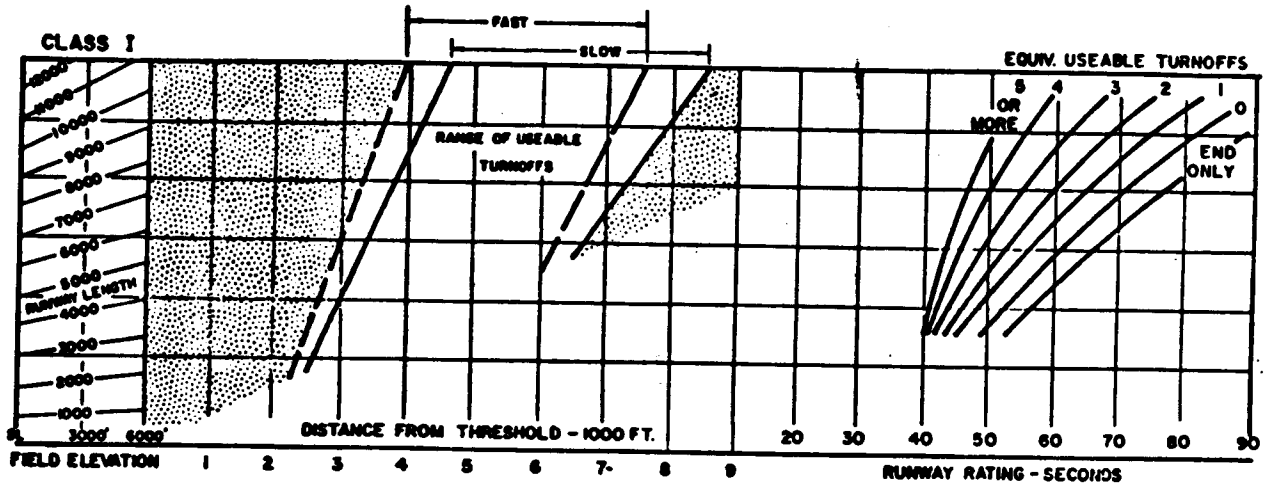


FIGURE 2-1  
**RUNWAY RATING**  
 AVERAGE LANDING OCCUPANCY TIME-SECONDS

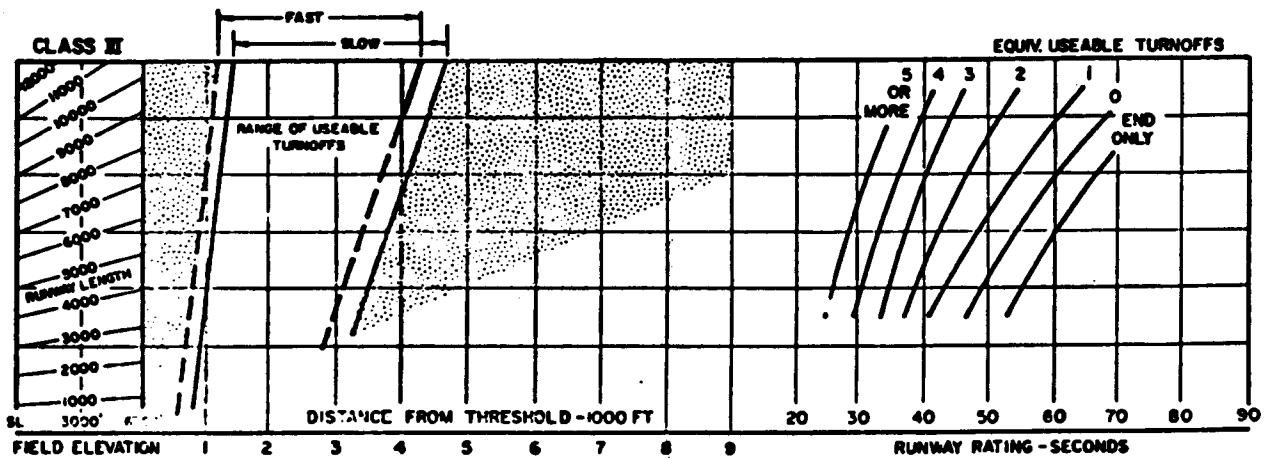
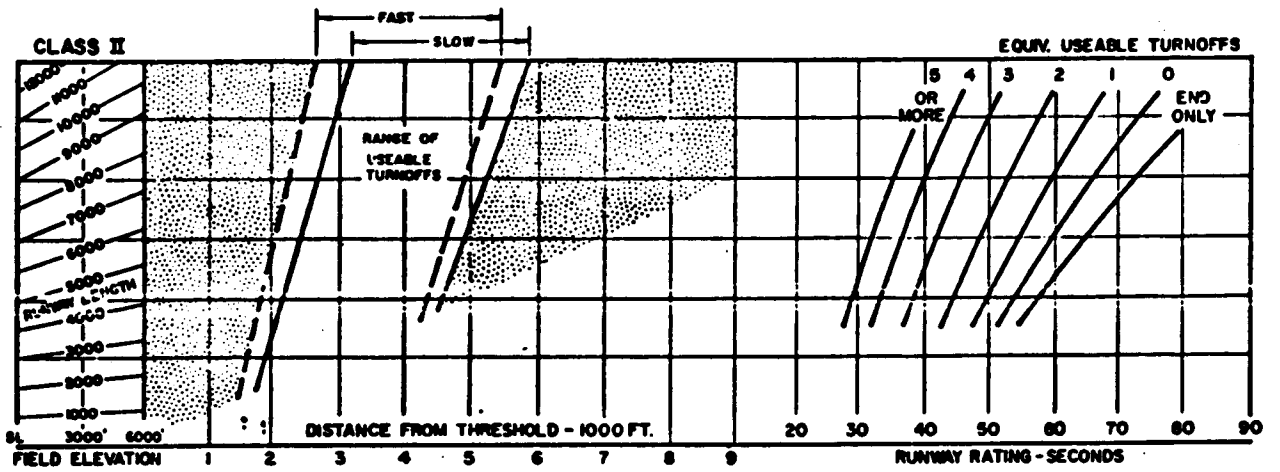
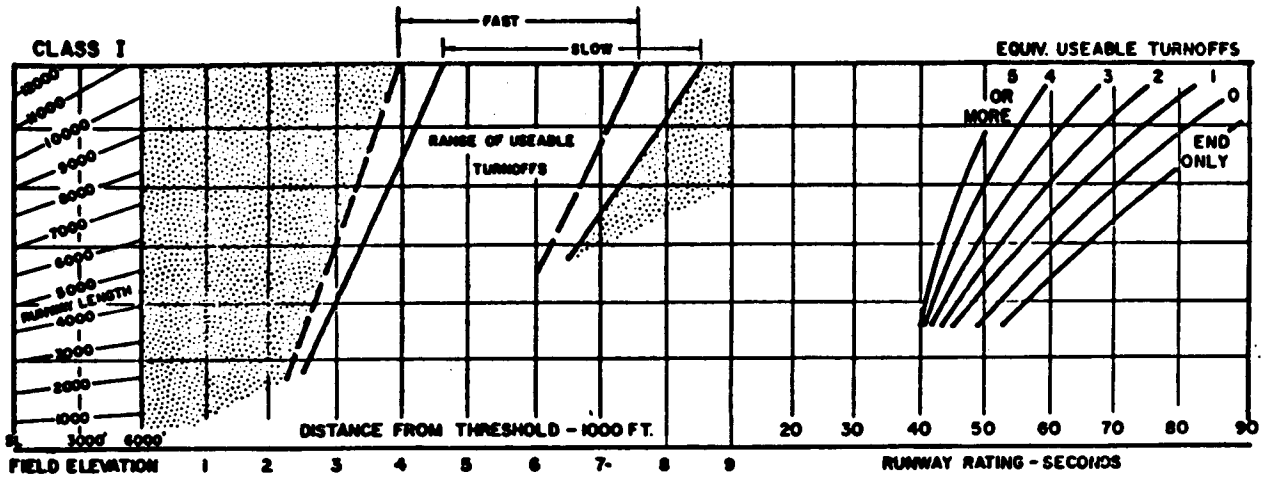
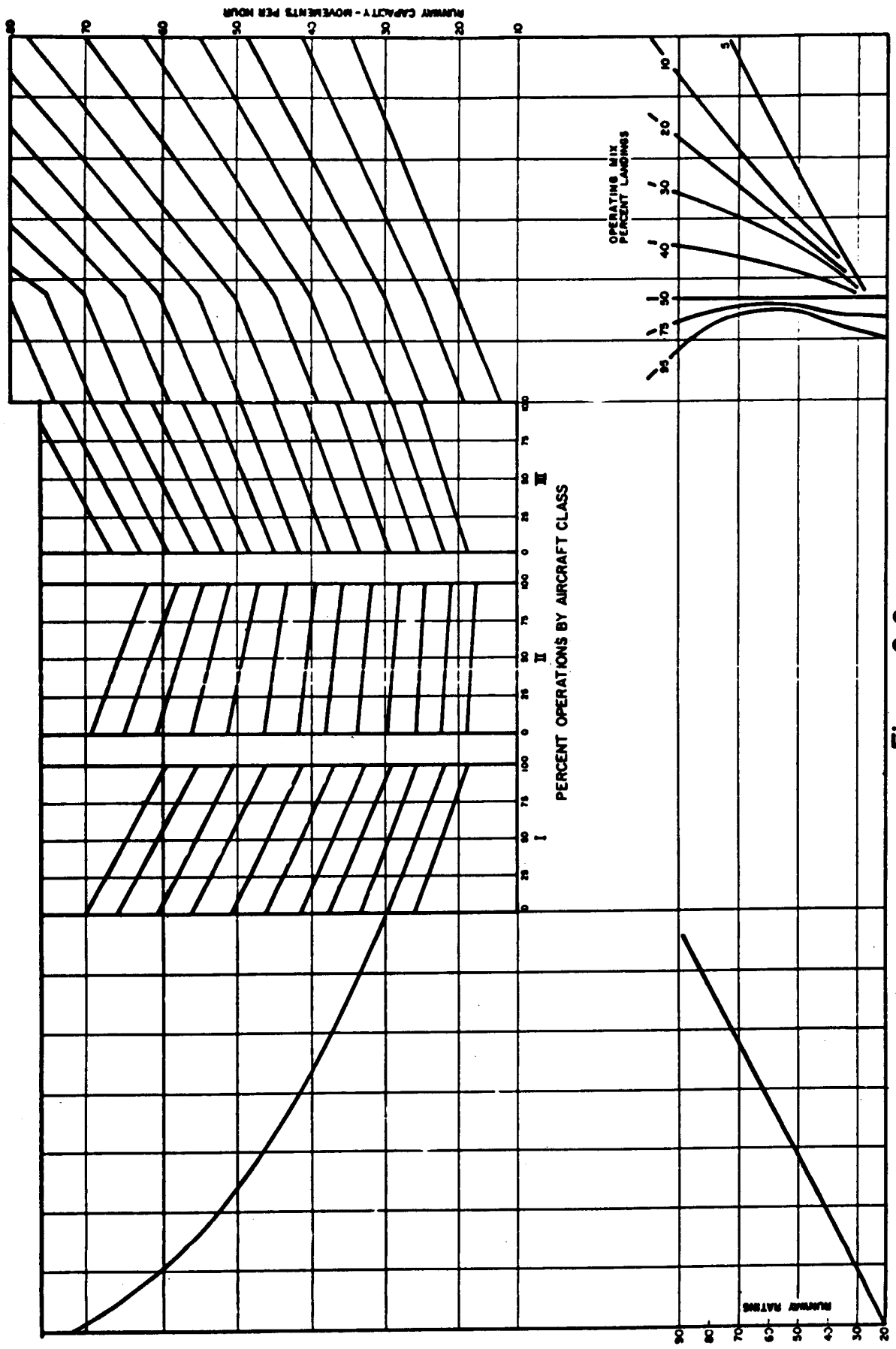


FIGURE 2-1

**RUNWAY RATING**  
**AVERAGE LANDING OCCUPANCY TIME-SECONDS**



**Figure 2-2**  
**VFR RUNWAY CAPACITY FOR MIXED OPERATIONS**

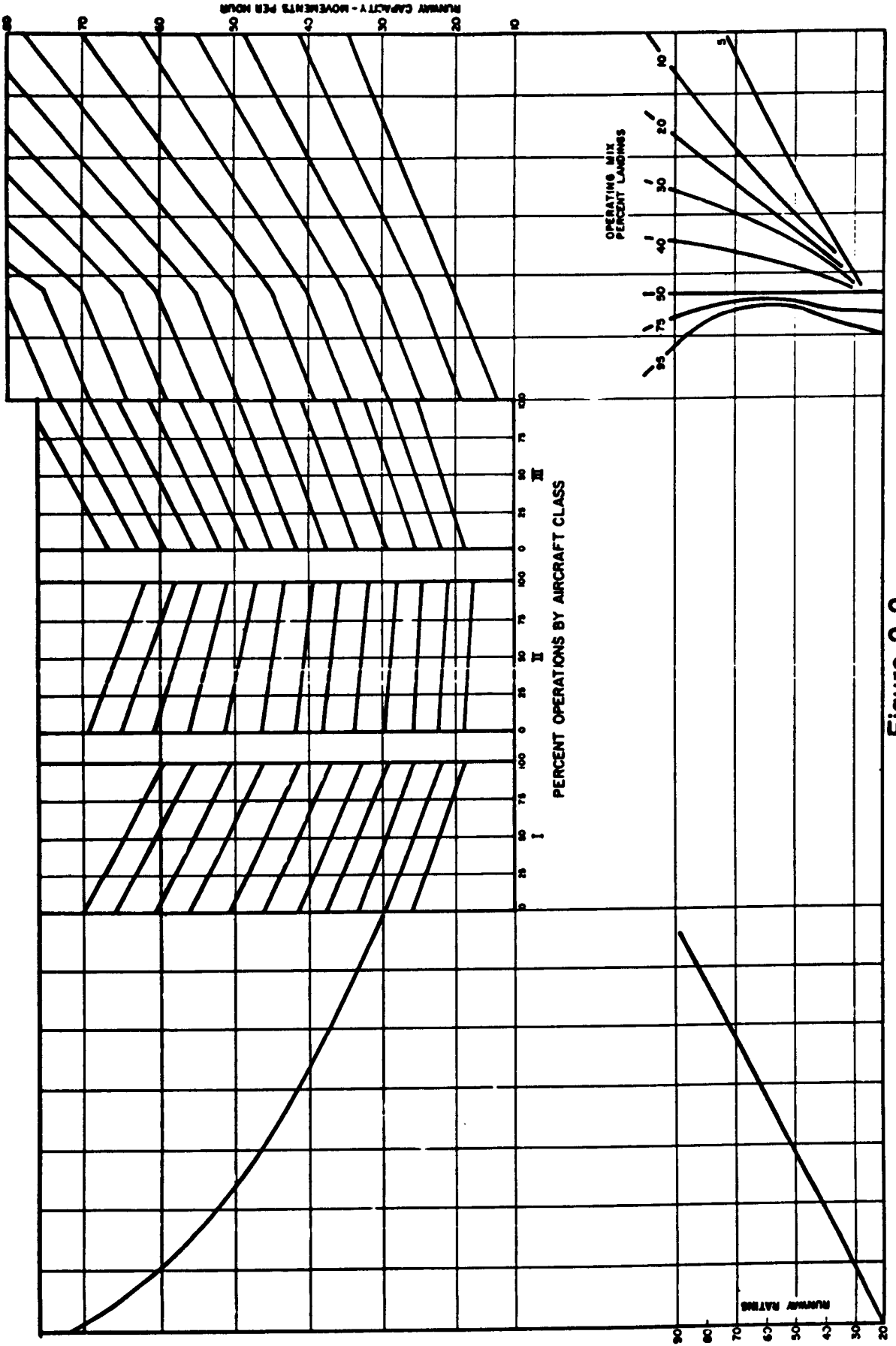


Figure 2-2  
**VFR RUNWAY CAPACITY FOR MIXED OPERATIONS**

Table 2-1

HAC - HOURLY ARRIVAL CAPACITY - Movements Per Hour

Aircraft Class	Runway Rating					
	30	40	50	60	70	80
I	50	47	44	40	35	30
II	57	52	47	42	38	33
III	63	62	58	53	47	41

Use of Table: Enter with Runway Rating for each aircraft class as obtained in Step 2 on Tables 2-4 or 2-5 and read HAC below. Interpolate as required.

Table 2-2

EQUIVALENT MOVEMENT FACTORS  
For Touch & Go or Landings in Formation

Landing Procedure	HAC - Movements per Hour							
	30	35	40	45	50	55	60	65
Formation of 2	.58	.59	.61	.62	.64	.65	.67	.68
Formation of 3	.45	.47	.49	.50	.52	.55	.56	.57
Formation of 4	.37	.40	.42	.44	.46	.48	.50	.52
Touch and Go	.17	.20	.23	.25	.27	.30	.33	.37

Use of Table: Enter HAC obtained above (Table 2-1) for each aircraft class and read Equivalent Movement Factors below. Interpolate as required.

Table 2-1

HAC - HOURLY ARRIVAL CAPACITY - Movements Per Hour

Aircraft Class	Runway Rating					
	30	40	50	60	70	80
I	50	47	44	40	35	30
II	57	52	47	42	38	33
III	63	62	58	53	47	41

Use of Table: Enter with Runway Rating for each aircraft class as obtained in Step 2 on Tables 2-4 or 2-5 and read HAC below. Interpolate as required.

Table 2-2

EQUIVALENT MOVEMENT FACTORS  
For Touch & Go or Landings in Formation

Landing Procedure	HAC - Movements per Hour							
	30	35	40	45	50	55	60	65
Formation of 2	.58	.59	.61	.62	.64	.65	.67	.68
Formation of 3	.45	.47	.49	.50	.52	.55	.56	.57
Formation of 4	.37	.40	.42	.44	.46	.48	.50	.52
Touch and Go	.17	.20	.23	.25	.27	.30	.33	.37

Use of Table: Enter HAC obtained above (Table 2-1) for each aircraft class and read Equivalent Movement Factors below. Interpolate as required.

Table 2-3

VFR HOURLY DEPARTURE CAPACITY (HDC) ANALYSIS WORK SHEET

Step No.	①	②	③	④	⑤	⑥	⑦	
Procedure	From Field Survey or Forecast	Constants	① × ②	③ <sub>S</sub> ÷ ③ <sub>G</sub>	Constants	④ <sub>S</sub> × ⑤	⑥ <sub>G</sub> × $\frac{①_G}{③_G}$	
Step Definition	Takeoff Demand		Equivalent Movement Factors	Takeoff Equivalent Movements	Class Distribution	Class HDC's	Weighted (HDC) <sub>E</sub>	Weighted (HDC) <sub>A</sub>
	Type Operation	No. of Aircraft						
Aircraft Class I	Single		1.00					
	FORMATION of	2		.80				
		3		.47				
		4		.40				
		Pairs		.50				
Sub-Totals I	S		S	S		49	S	
Aircraft Class II	Single		1.00					
	FORMATION of	2		.83				
		3		.51				
		4		.46				
		Pairs		.50				
Sub-Totals II	S		S	S		63	S	
Aircraft Class III	Single		1.00					
	FORMATION of	2		.89				
		3		.59				
		4		.54				
		Pairs		.50				
Sub-Totals III	S		S	S		90	S	
ALL CLASSES	Grand-Totals	① <sub>G</sub>		③ <sub>G</sub>	④ <sub>G</sub>		⑥ <sub>G</sub>	



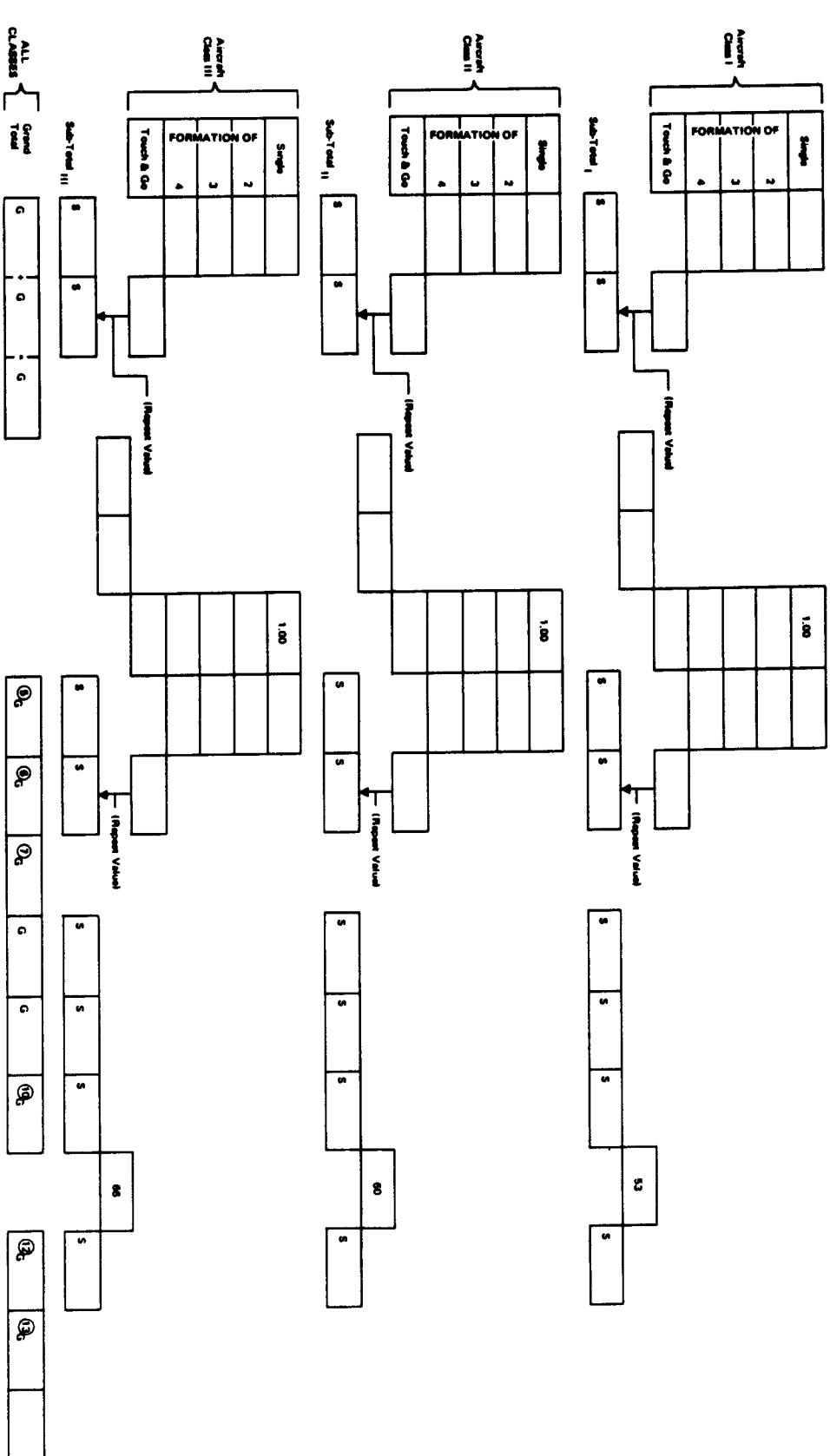
**Table 2-3**  
**VFR HOURLY DEPARTURE CAPACITY (HDC) ANALYSIS WORK SHEET**

Step No.	①	②	③	④	⑤	⑥	⑦	
Procedure	From Field Survey or Forecast	Constants	① × ②	③ ÷ ④	Constants	④ × ⑤	⑥ ÷ ⑦	
Step Definition	Takeoff Demand		Equivalent Movement Factors	Takeoff Equivalent Movements	Class Distribution	Class HDC's	Weighted (HDC) <sub>E</sub>	Weighted (HDC) <sub>A</sub>
	Type Operation	No. of Aircraft						
Aircraft Class I	Single		1.00					
	FORMATION of	2		.60				
		3		.47				
		4		.40				
		Pairs		.50				
Sub-Totals I	S		S	S		40	S	
Aircraft Class II	Single		1.00					
	FORMATION of	2		.63				
		3		.51				
		4		.46				
		Pairs		.50				
Sub-Totals II	S		S	S		63	S	
Aircraft Class III	Single		1.00					
	FORMATION of	2		.68				
		3		.58				
		4		.54				
		Pairs		.50				
Sub-Totals III	S		S	S		90	S	
ALL CLASSES	Grand-Totals	① <sub>G</sub>		③ <sub>G</sub>	④ <sub>G</sub>		⑥ <sub>G</sub>	

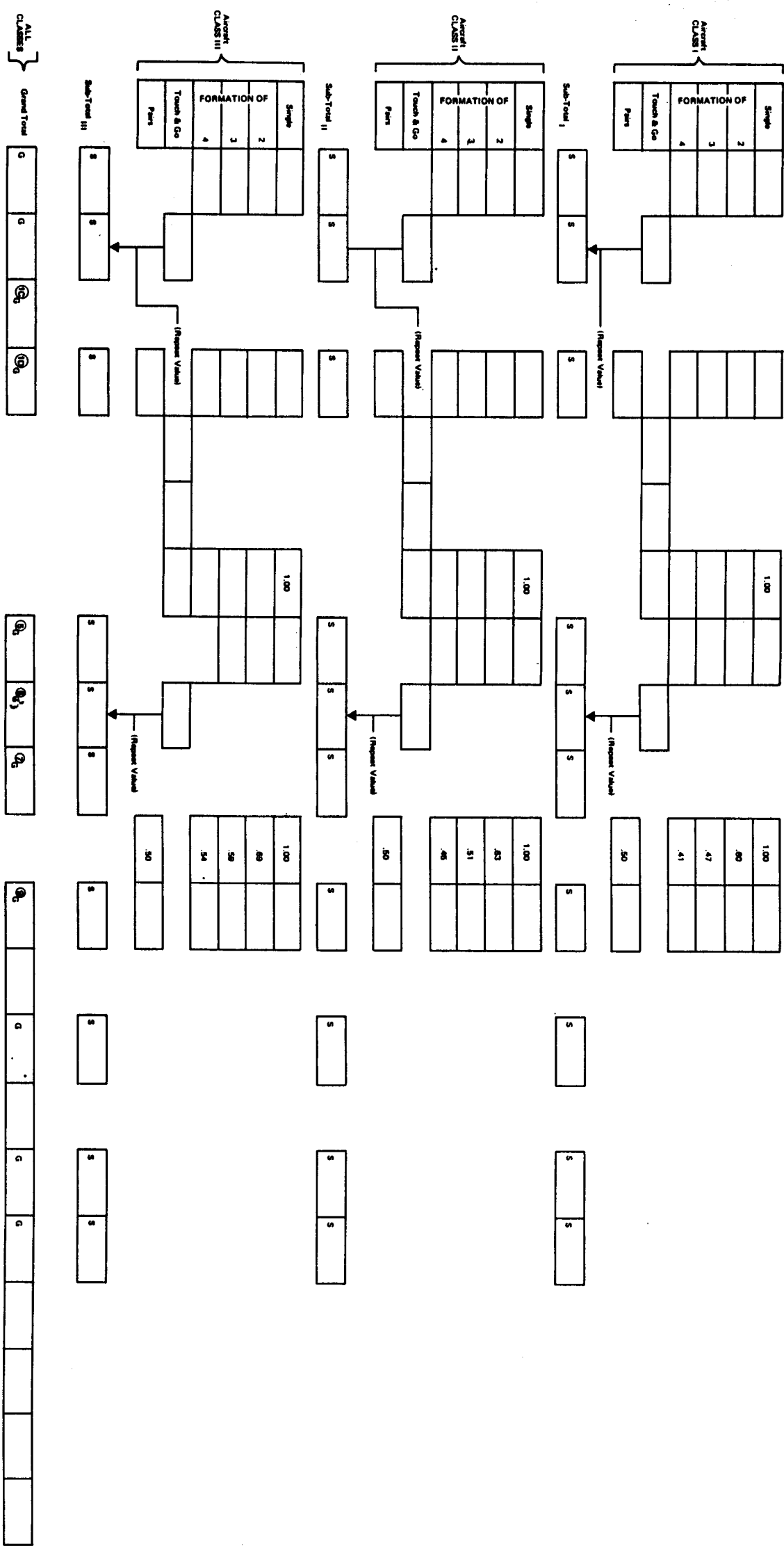


Table 2-4  
VFR HOURLY ARRIVAL CAPACITY (HAC) ANALYSIS WORK SHEET

Step No.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭
Procedure	FROM FIELD SURVEY OR FORECAST				USE FIG. No. 2-1	USE TABLE No. 2-1	USE TABLE No. 2-2	⑬-⑭	⑮-⑯	⑰-⑱	⑲-⑳	㉑-㉒	㉓-㉔	㉕-㉖
Step Definition	Type	Question	LANCHING DESIRED	USE FIG. No. 2-1	USE TABLE No. 2-1	USE TABLE No. 2-2	⑬-⑭	⑮-⑯	⑰-⑱	⑲-⑳	⑲-⑳	㉑-㉒	㉓-㉔	㉕-㉖
			No. of Aircraft Touch & Go	Primary Rating	Class HAC	Equivalent Equipment Factors	Non-Touch & Go Equivalent Measurement	Touch & Go Equivalent Measurement	Total Equivalent Measurement	Non-Touch & Go Class Distribution	Touch & Go Class Distribution	Non-Touch & Go Weighted HAC	Touch & Go HAC's	Touch & Go Weighted HAC
			Total									Weighted (HAC) E	Weighted (HAC) A	



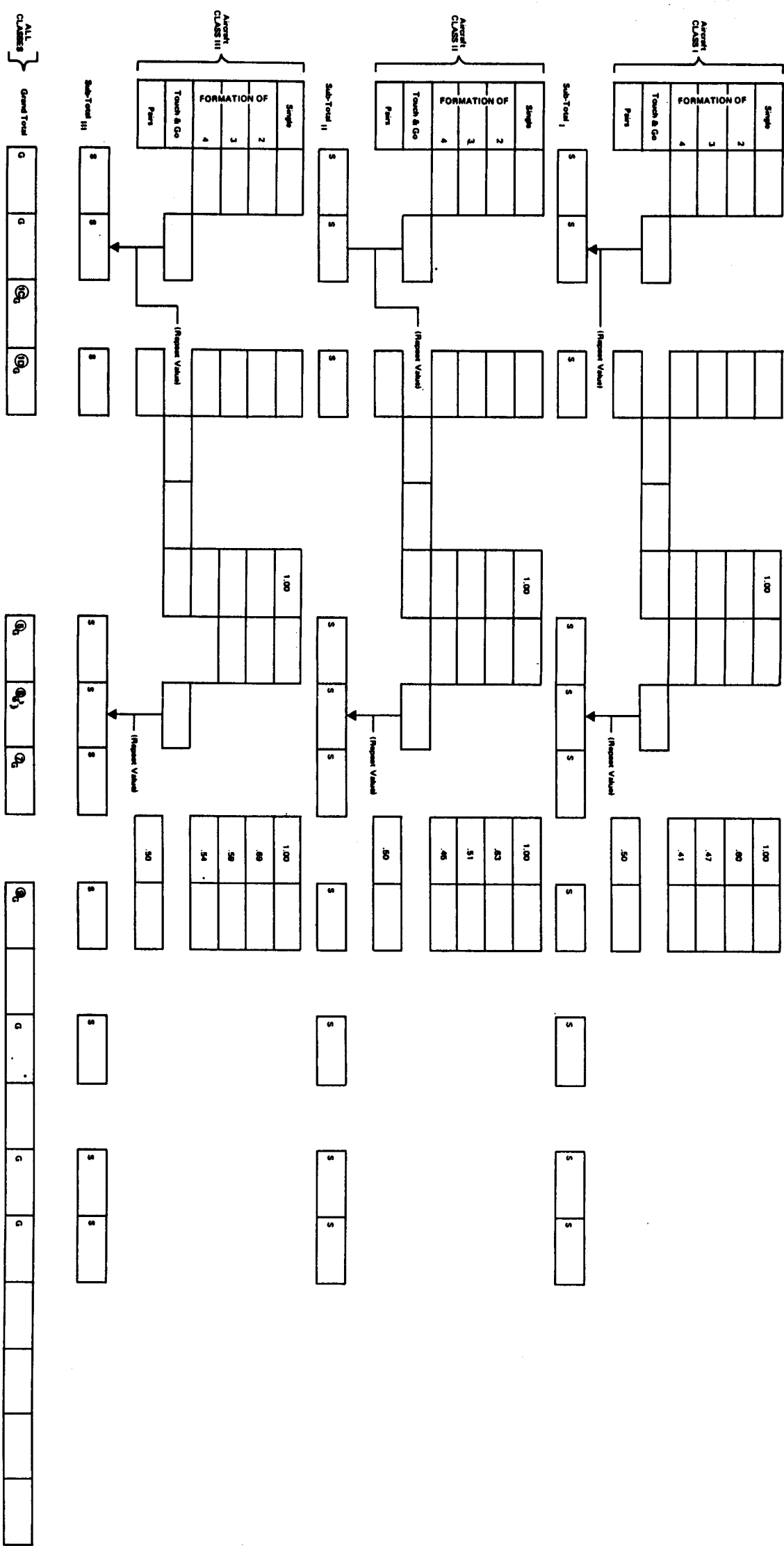
Step No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18				
Procedure	FROM FIELD SURVEY OR FORECAST										USE FIG. No. 2-1	USE TABLE No. 2-1	USE TABLE No. 2-2									
Step Definition	TYPE OPERATION	No. of LANDING AIRCRAFT			No. of Aircraft	Class Runway Rating	Class HMC's	Landing Equivalent Factors	Non Touch & Go Movements	Touch & Go Movements	Total Landing Movements	Tactical Equivalent Factors	Tactical Movements	Total Tactical Landings	Total Take-Off & Land. Movements	Percent Landing	Class Distribution	Weighted Runway Rating		USE FIG. No. 2-2	HMC E	HMC A
		Non Touch & Go	Touch & Go	Total														Non Touch & Go	Touch & Go			



\* CROSS CHECK:  $D_{10} + D_{11} + D_{12} = D_{13} + D_{14} + D_{15}$

Table 2-5  
VFR HOURLY MIXED CAPACITY (HMC) ANALYSIS WORK SHEET

Step No.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰					
Procedure	FROM FIELD SURVEY OR FORECAST										USE FIG. No. 2.1	USE TABLE No. 2.1	USE TABLE No. 2.2									
Step Definition	TYPE OPERATION	No. of LANDING AIRCRAFT			No. of Aircraft	Class Runway Rating	Class HMC's	Landing Equivalent Factors	Non Touch & Go Movements	Touch & Go Movements	Total Landing Movements	CONSTANTS		Total Touch & Go Landings	Total % of Land Equivalent Movements	Percent Landing	Class Distribution	Weighted Runway Rating		USE FIG. No. 2.2	HMC E	HMC A
		Touch & Go	Touch & Go	Total								Touch & Go	Touch & Go					Touch & Go	Touch & Go			



\* CROSS CHECK:  $D_{10} + D_{11} + D_{12} + D_{13} + D_{14} + D_{15} + D_{16} + D_{17} + D_{18} + D_{19} + D_{20} + D_{21} + D_{22} + D_{23} + D_{24} + D_{25} + D_{26} + D_{27} + D_{28} + D_{29} + D_{30} + D_{31} + D_{32} + D_{33} + D_{34} + D_{35} + D_{36} + D_{37} + D_{38} + D_{39} + D_{40} + D_{41} + D_{42} + D_{43} + D_{44} + D_{45} + D_{46} + D_{47} + D_{48} + D_{49} + D_{50} + D_{51} + D_{52} + D_{53} + D_{54} + D_{55} + D_{56} + D_{57} + D_{58} + D_{59} + D_{60} + D_{61} + D_{62} + D_{63} + D_{64} + D_{65} + D_{66} + D_{67} + D_{68} + D_{69} + D_{70} + D_{71} + D_{72} + D_{73} + D_{74} + D_{75} + D_{76} + D_{77} + D_{78} + D_{79} + D_{80} + D_{81} + D_{82} + D_{83} + D_{84} + D_{85} + D_{86} + D_{87} + D_{88} + D_{89} + D_{90} + D_{91} + D_{92} + D_{93} + D_{94} + D_{95} + D_{96} + D_{97} + D_{98} + D_{99} + D_{100} = D_{101}$

Table 2-5  
VFR HOURLY MIXED CAPACITY (HMC) ANALYSIS WORK SHEET

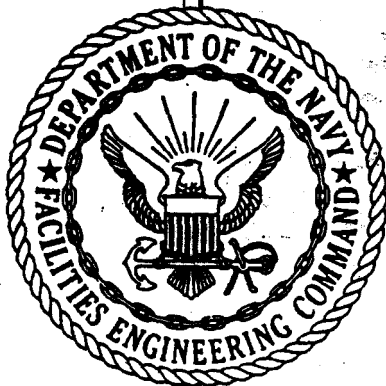
## **Supersession to FC 2-000-05N Appendix D (formerly NAVFAC P80.2 and UFC 2-000-05N)**

Appendix D – Naval Mobile Construction Battalion Facilities (formerly P-80.2) was published on May 1, 1976 and is no longer an accurate description of the planning criteria required for facilities supporting a Naval Mobile Construction Battalion. Therefore, this supersession document has been created as a replacement and all category code and criteria information now reside in the FC 2-000-05N.

Naval Mobile Construction Battalion facilities utilize a number of expeditionary, operational, and base operations related category code numbers (CCNs) to define requirements. Some of these CCNs were added or updated in 2018 and 2019. Specific production or revision dates can be found on the revision pages included at the beginning of every FC sub section document (100-900 series). The following facilities are typically required to support a Naval Mobile Construction Battalion:

- 14309 Expeditionary Ops Support Facility
- 14311 Operational Vehicle Garage
- 14312 Operational Vehicle Laydown Area
- 12317 Overhead Cover, Miscellaneous
- 21451 Automotive Organizational Shop
- 21455 Vehicle Wash Platform
- 21710 Electronics/Communications Maintenance Shop
- 85210 Parking Area

This is the current list of NMCB related CCNs as of April 2019 and detailed descriptions of each are provided in the FC 2-000-05N. This list will be updated here and in the FC as mission dictates in the future.



# FACILITY PLANNING --FACTOR CRITERIA FOR -NAVY & MARINE CORPS SHORE INSTALLATIONS

Appendix E  
AIRFIELD SAFETY CLEARANCES

NAVFAC P-80.3  
JANUARY-1982

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SECTION I - GENERAL

A. RJR:EOSE. The purpose of this Appendix is to (1) provide facility planners with guidance for identifying obstructions to air navigation and (2) establish airfield safety clearances for fixed wing aircraft and helicopter installations. The Appendix amplifies information provided in Federal Aviation Regulation Part 77, Objects Affecting Navigable Airspace and includes airfield clearance criteria specified in the Joint Service Manual NAVFAC P-971 (Airfield and Heliport Planning criteria). Standards herein identify three types of airfield safety criteria:

(a) Height restrictions. Restrictions in the form of specific height limits or imaginary surfaces through which objects shall not penetrate.

(b) Lateral Clearances. Standards as to how close objects may be sited to airfield pavements regardless of their height including separations between airfield pavements.

(c) Clear Zones/Takeoff Safety Zones. The areas immediately adjacent to runway and helipad thresholds provide for unobstructed takeoffs and landings and serve as emergency overrun areas. Detailed guidance is required to prevent obstructions in these areas.

The clearances and imaginary surfaces defined herein are to be used solely for siting facilities and determining obstructions as differentiated from standards to determine flight paths, glide slopes, etc; actually flown by aircraft.

As a secondary purpose, the Appendix identifies some other factors related to aircraft operations such as noise and accident potential which should be considered when siting facilities at air installations. The criteria in this Appendix conform to that established by the Department of Defense for the Air Installations Compatible Use Zone (AICUZ) Program.

The following manuals and instructions are pertinent to planning and siting facilities at Navy and Marine Corps air installations.

Federal Aviation Regulation, Part 77	Objects Affecting Navigable Airspace
DOD 4270.1-M	Department of Defense construction Criteria Manual
DOD INST 4165.57	Air Installation Compatible Use Zones
OPNAVINST 11010.36	Air Installations compatible Uses Zones (AICUZ) Program
NAVFACINST 11010.57B	Site Approval of Naval Shore Facilities
MCO P 11000.12A	Real Property Facilities Manual, Vol II, Facilities Planning and Programming
NAVFAC DM-21 (Series)	Airfield Pavements
NAVSEA OP-5, Vol I	Ammunition and Explosives Ashore

B. APPLICABILITY/WAIVERS. The criteria in this Appendix apply to Navy and Marine Corps air installations located in the United States, its territories, trusts, and possessions. Where a Navy or Marine Corps air installation is a tenant on a civil airport use these criteria to the extent practicable, otherwise FAA criteria apply. Where a Navy/Marine Corps air installation host a civilian airport, these criteria shall apply. Also apply these standards to the extent practicable at overseas locations where the Navy and Marine Corps have vested base rights. While the criteria in this Appendix are not intended for use in a theater-of-operations situation, they may be used as a guideline where prolonged use is anticipated and no other standard has been designated.

The criteria shall be used for planning all new air installations and new airfield pavements at existing air installations. (Exception: Primary surfacewidth for Class B runways, See Section II, paragraph C1.) Existing air installations have been developed using previous standards which may not conform to the criteria herein. Safety clearances at existing air installations need not be upgraded solely for the purpose of conforming to these criteria. However, at existing air installations where few structures have been sited/constructed in accordance with previous safety clearances, it may be feasible to apply the revised standards herein. The changes in standards primarily affect criteria for: (1) Class A designated runways (2) runways at basic training outlying fields used by T-34 aircraft and (3) helicopter landing

facilities operating under Visual Flight Rules. Approval from Headquarters NAVFACENGCOM shall be obtained prior to revising safety clearances at existing airfield pavements to conform with new standards herein. NAVFACENGCOM will coordinate the approval with the Naval Air Systems Command and CNO/CMC as required.

Once safety clearances have been established for an air installation, there may be occasions where it is not feasible to meet the designated standards. In these cases a waiver must be obtained from the Naval Air Systems Command. The waiver and its relationship to the site approval process is defined in NAVFACINST 11010.57, Site Approval of Naval Shore Facilities.

C. EXEMPTIONS FROM WAIVER. Certain navigational and operational aids

normally are sited in violation of airspace safety clearances in order to operate effectively. The following aids are within this group and require no waiver from NAVAIR, provided they are sited in accordance with NAVFAC Definitive Designs (P-272) and/or the NAVFAC Design Manuals (OM Series):

- a. Approach lighting systems
- b. Visual Approach Slope Indicator (VASI) systems
- c. Permanent Optical Lighting System (OLS), portable OLS and Fresnel lens equipment
- d. Runways distance markers
- e. Arresting Gear (A/G) systems including A/G signs
- f. Taxiway guidance, holding and orientation signs
- h. All beacons and obstruction lights
- i. Arming and de-arming pad

D. DEFINITIONS.

Airfield Reference Point. The designated geographical location of an airfield. It is given in terms of the nearest second of latitude and longitude. The position of the reference point must be as near to the geometric center of the landing area as possible, taking future development of the airfield into account.

Established Airfield, Heliport or Helipad Elevation. The established elevation of the highest point of the usable landing area in terms of the nearest foot above mean sea level.



SECTION II - AIRFIELD CLEARANCES-FIXED WING AIRCRAFT

A. RUNWAY CLASSIFICATION. This Appendix uses the same runway classification system, Class A and B, established by the Office of the Secretary of Defense as a means of defining accident potential zones (APZs) for the Air Installations Compatible Use Zones (AICUZ) program. The runway classification must be known in order to determine the proper clear zone and air space criteria for a runway. The classification is dependent on the type of aircraft which operate from the runway:

TABLE A  
RUNWAY CLASSIFICATIONS BY AIRCRAFT TYPE

Class A Runways

C-1	C-47	OV-10	T-44
C-2	C-117	S-2	u-10
C-4	E-1	T-28	u-11
C-6	E-2	T-34	u-21
C-7	O-1	T-41	UV-18
c-12	O-2	T-42	
C-45	OV-1		

A-3	<del>C-10</del>	F-4	P-2
A-4	<del>C-14</del> Runways	F-5	P-3
A-5	C-15	F-8	S-3
A-6	C-118	F-14	SR-71
A-7	c-121	F-15	T-2
A-8	C-123	F-16	T-29
A-10	C-130	F-17	T-33
A-18	C-131	F-18	T-37
AV-8	C-135	F-100	T-38
B-1	C-137	F-101	T-39
B-52	C-140	F-104	TR-1
B-57	C-141	F-105	U-2
C-5	E-3	F-106	
C-9	E-4	F-111	



Class A runways are primarily used by small light aircraft as indicated in Table A and the runway should not have the potential for development for use by heavier aircraft or have a foreseeable requirement for such use. Ordinarily, Class A runways are less than 8000 feet long and less than 10 percent of the operations involve class B type aircraft. Class B runways are a major runways except basic training outlying fields used by T-34 aircraft for which special criteria are specified.

: The classification of Navy and Marine Corps runways is determined as a part of the AICUZ program and is published in the AICUZ study for a particular installation. NAVPACENGCOM and NAVAIRSYSCOM concurrence and CMC/CNO approval is required prior to classifying any runway Class A or B. This approval is obtained via approval of the AICUZ study.

B. OBSTRUCTIONS TO AIRSPACE. The following paragraphs set standards for determining whether an object or structure is an obstruction to air navigation. It applies to existing and proposed objects including objects of natural growth or terrain. Facilities shall be sited so as not to be an obstruction to airspace.

An existing object (including a mobile object) is, and a future object would be, an obstruction to air navigation if it is higher than any of the following heights or surfaces.

- A height of 500 feet above ground level at the site of the object.

A height that is 200 feet above ground level or above the established airfield elevation, whichever is higher, within 3 nautical miles of the established reference point of an airfield. This height increases in the proportion of 100 feet for each additional nautical mile of distance from the airfield up to a maximum of 500 feet.

*Flight  
procs.*

c. A height that results in raising an established or proposed Minimum Descent Altitude (MDA) within the initial approach segment, or the intermediate approach segment; or that which raises the Decision Height (DH) for Precision Approach Radar (PAR) or Instrument Landing system (ILS) glide slopes within the final approach segment; or that which affects a departure or missed approach climb gradient within the departure area or missed approach segment; or that which affects the MDA within the circling approach area.

*Flight  
procs*

d. A height within an enroute obstacle clearance area, including turn and termination areas, of a federal airway or approved off-airway route that would increase the minimum obstacle clearance altitude.

e. The surface of a takeoff and landing area of an airfield or any imaginary surface as defined in Section II, paragraph C (Section III, Paragraph C for helicopter facilities). However, no part of the takeoff or landing area itself is considered an obstruction.

The height restrictions in paragraphs (a), (b) and (e) can be evaluated by planning personnel. The restrictions imposed by paragraphs (c) and (d) should be evaluated by flight operations personnel, however the planner should be aware of their existence.

Traverse ways (roads, railroads, canals etc) must be considered in terms of height of the objects using them. This is done by establishing a minimum vertical clearance (the clearance represents the height of the object using the traverse way) which must be maintained between the traverse way and the imaginary surfaces. The clearances are given in Table B and must be maintained except when :

a. Use of the traverse way is controlled. Control in this sense is exercised by Air Traffic Control (ATC) facility or through an agreement between the responsible ATC facility and another agency with the capability to exercise control.

b. Use of an existing traverse way is physically limited to lesser heights. For example, overpasses along a public highway have a clearance of 13 feet thereby restricting use of the highway to vehicles of 13 feet in height or less. Thirteen feet could then be used as the minimum vertical clearance requirement.

TABLE B  
Highway, Railroad and Waterway Clearances

Item Description	Traverse Way	Clearance
Minimum vertical clearance between established imaginary surfaces and traverse ways	Interstate highway that is part National System of Military and Interstate Highways	17 ft
	Other public highways not covered above	15 ft
	Private or military road	10 ft minimum, or height of highest mobile object that normally would traverse them, whichever is greater
	Railroads	23 ft
	Waterway or other traverse way not previously covered	A distance equal to the height of the highest mobile object that normally would traverse them

C. IMAGINARY SURFACES. The following imaginary surfaces are defined for fixed wing aircraft facilities and are shown on the figures at the end of Section II.

1. Primary Surface. A surface on the ground centered

lengthwise on the runway and extending 200 feet beyond each end of the runway. The width of the primary surface is:

- a) 1000 feet - Class A runways  
- Basic Training Outlying Fields (OLFs) used by T-34 aircraft
- b) 1500 feet - Class B runways constructed prior to June 1981
- c) 2000 feet - Class B runways constructed at new air installations where no runway existed prior to June 1981

NAVAIRSYSCOM, in coordination with NAVFACENCOM, will determine on an individual basis whether a 1500 or 2000 foot wide primary surface shall be applied for new Class B runways constructed at air installations having existing runways with a 1500 foot wide primary surface.

2. Clear Zone Surface. See section II, paragraph D for Clear Zone standards.

3. Approach Departure Clearance Surface. An inclined or combination inclined and horizontal plane, symmetrical about the runway centerline extended. The inclined plane flares outward and upward from the primary surface, beginning with the same width as the primary surface and starting with the centerline elevation at the runway end. The slope and dimensions of the surface vary by runway class:

- a. Class A runway. The slope of the surface is 40 to 1 until it reaches an elevation of 500 feet above the established airfield elevation. It then continues horizontally at this elevation to a point 50,000 feet from the point of beginning. The outer width is 16,000 feet.
- b. Class B runway. The slope of the surface is 50 to 1 until it reaches an elevation of 500 feet above the established airfield elevation. It then continues horizontally at this elevation to a point 50,000 feet from the point of beginning. The outer width is 16,000 feet.
- c. OLF Basic Training Outlying Field (for T-34 aircraft). The slope of the surface is 20:1 and the surface continues until it rises 400 feet in elevation. The surface flares outward at an angle of 50° 43'.

4. Inner Horizontal Surface. An oval shaped plane at a height of 150 feet above the established airfield elevation. For Class A and B runways it is constructed by scribing an arc with a radius of 7,500 feet about the centerline at each end of each runway and interconnecting these arcs with tangents. The radius is reduced to 3,200 feet at Basic Training outlying Fields (for T-34 aircraft).

5. Conical Surface. An inclined plane that extends from the periphery of the inner horizontal surface outward and upward at a 20 to 1 slope. For Class A and B runways it extends for horizontal distance of 7,000 feet and to a height of 500 feet above the established airfield elevation. For Basic Training OLF (T-34 aircraft) runways, it extends for a horizontal distance of 5,000 feet and to a height of 400 feet above the established airfield elevation.

6. Outer Horizontal Surface. For Class A and B runways, a plane located 500 feet above the established airfield elevation, extending outward from the outer periphery of the conical surface for horizontal distance of 30,000 feet. This surface is not applied at Basic Training Outlying fields (T-34 aircraft).

7. Transitional Surface.

a. Class A and B runways. Inclined planes which connect the primary surface and the approach-, departure clearance surface to the inner horizontal surface, conical surface, outer horizontal surface or other transitional surfaces. The slope is 7 to 1 outward and upward from the primary and approach-departure clearance surfaces at right angles to the runway centerline and runway centerline extended. To determine the elevation for the beginning of the transitional surface at any point along the lateral boundary of the primary surface, draw a line from the point, perpendicular to the runway centerline or the runway centerline extended. The elevation of the runway centerline extended at that intersection is the elevation for the

*14 Elev*

b. Basic Training OLF (T-34 aircraft). Same definition as for the Class A and B runway except the slope is 2:1.

8. CLEAR ZONES. The areas adjacent to the runway thresholds require special restrictions to provide aircraft overrun areas and unrestricted visibility of airfield lighting. To accomplish this, clear zones are specified for each class of runway and further, the clear zone is subdivided into types I, II and III to define the degree of restrictive use. The standards herein are in conformance with clear zone sizes specified in the AICUZ program.

CLEAR ZONE DIMENSIONS

Type Runway	Clear zone	Clear Zone Width	Remarks
Class A	_____	1000 FT	NOTE 1.
Class B	Length 3000	Same as approach departure-clearance surface	NOTE 2.
Basic Training OLF (T-34)	3000 Ft	1000 Ft	NOTE 3.

NOTE 1. The class A runway and clear zone are new to Navy and Marine Corps planning standards. Previously, all air installations except OLF's for basic training propeller aircraft received a clear zone equivalent to what is now specified for Class B runways. The criteria for Class A runway clear zones should only be applied after CID/CMC has approved the classification of a particular runway as Class A.

NOTE 2. The DOD AICUZ program allows for a rectangular clear zone with a 3000 foot width for new construction, however, Navy accident data indicates the fan shaped clear zone is adequate for Navy installations. Clear zones with 3000 foot width shall not be planned unless coordinated with Headquarters, NAVFACENGCOM.

NOTE 3. The width of clear zone for basic training OLF's used by propeller aircraft was previously defined by the width of the approach-departure clearance surface. The criteria have been revised to conform with AICUZ guidelines.

The restrictions on land use within a clear zone vary. Therefore, the clear zone has been divided into three areas, Type I, II and III, for which specific restrictions are specified.

a. Clear Zone (Type-I) - This zone is immediately adjacent to the end of the runway. It should be cleared, graded and free of above ground objects (except airfield lighting) and is to receive special ground treatment or pavement in the area designated as the runway overrun. This type clear zone is required at both ends of all runways.

b. Clear Zone (Type - II) - This zone is used only for class B runways and is an extension of the Type I clear zone except that the width is reduced. The Type II clear zone shall be graded and cleared of all above ground objects except airfield lighting.

c. Clear Zone (Type III). This zone is laterally adjacent to the type II clear zone for Class B runways and is used in lieu of the type II clear zone at Class A runways and basic training OLFs used by T-34 aircraft. Objects in this zone shall not penetrate the approach departure clearance surface. Trees, shrubs, bushes, or any other natural growth shall be kept below the approach departure clearance surface or to a lesser height if necessary. Buildings for human habitation shall not be sited in the Type III Clear Zone unless they would not reduce the approach departure clearance surface. The land in this type clear zone is best utilized for agriculture or permanent open space exclusive of agricultural uses which would attract birds or waterfowl. Land uses which would include human activity for extended periods or group activities should be avoided. Traverses (roads, railroads, canals, etc.) are permitted provided they would not penetrate airfield imaginary surfaces after the traverse way has been increased by the distance in Section II, paragraph ...

**E. LATERAL CLEARANCES.** In order to insure the safe operation of aircraft on the ground there are lateral clearances established for most airfield pavements. For example, no structures shall be sited within 100 feet of the edge of a taxiway, apron, runway, or runway parallel to a runway. The lateral clearances are listed in P-80 under the category code for the pavement to which they apply.

**F. OTHER CONSIDERATIONS.**

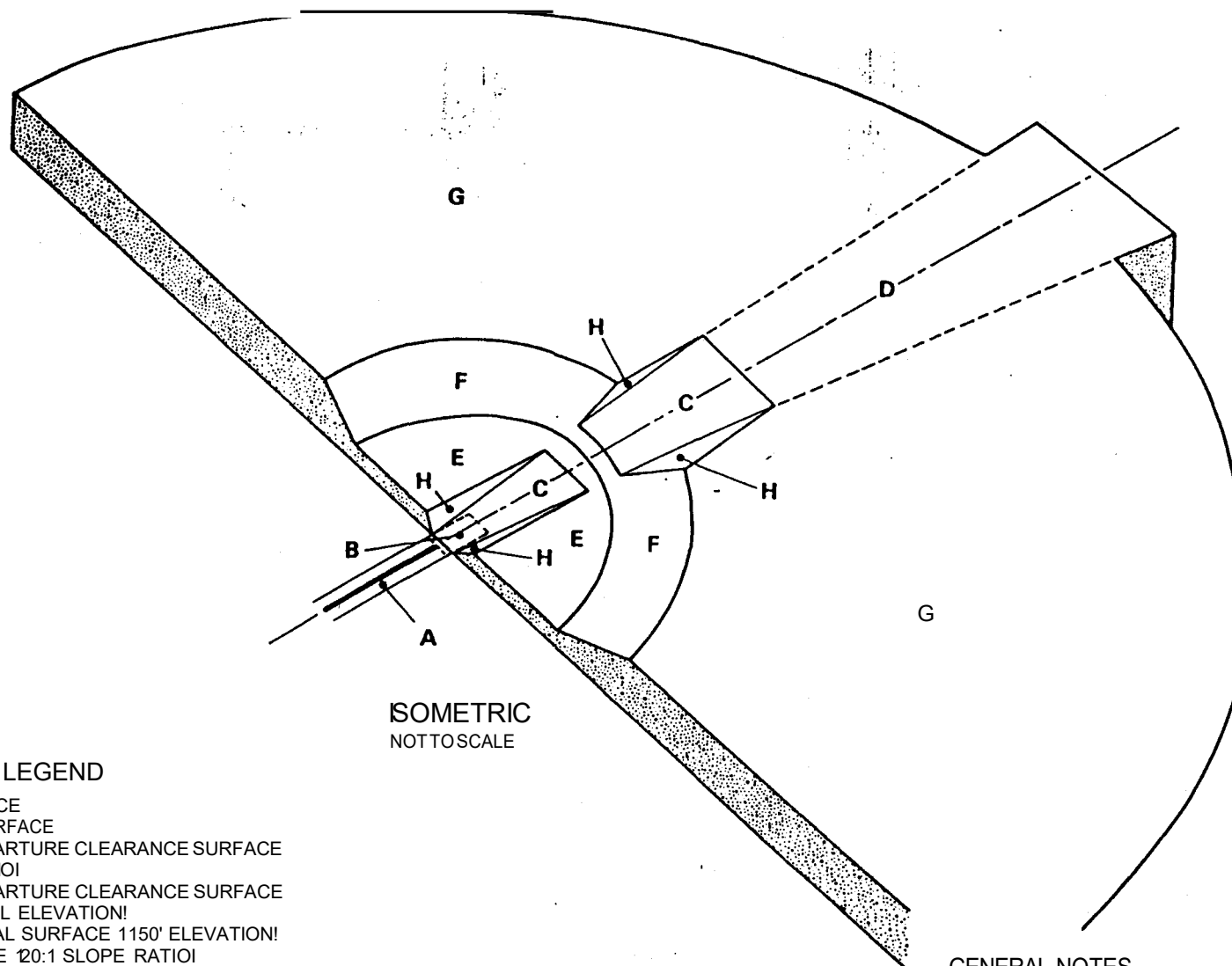
1. Air Installations Compatible Use Zones (AICUZ) Program. The criteria herein related to clear zones conforms to Navy AICUZ guidelines established by OPNAVINST 11010.36, Air Installation Compatible Use Zones (AICUZ) Program. The AICUZ concept embodies a method of defining, quantifying and mapping aircraft noise, potential aircraft accident areas and existing or potential incompatible land uses, both on and off an air installation. The criteria herein is concerned with avoiding obstructions to air navigation and therefore does not address the aircraft accident potential zones, noise descriptions or compatible land use guidelines identified in the AICUZ program. OPNAVINST 11010.36 should be used as a basis for applying AICUZ guidelines.

2. Airfield Explosives Prohibited Areas. The Naval Sea Systems Command has established criteria with respect to handling and storing ammunition and explosives which are published in NAVSEA OP-5, Volume 1, Ammunition and Explosives Ashore. This publication addresses areas near runways and under flight paths where ammunition and explosives are prohibited and NAVSEA OP-5 should be used for ordnance safety criteria.

**G. DRAWINGS.** The following Figures are provided to illustrate the imaginary surfaces, typical airfield layouts and clear zones.

<b>Fig</b>	<b>Title</b>
<b>II-1</b>	CLASS A RUNWAY-AIRSPACE (ISOMETRIC)
<b>II-2</b>	CLASS A RUNWAY-AIRSPACE (PLAN & SECTIONS).
<b>II-3</b>	CLASS A RUNWAY-TYPICAL LAYOUT
<b>II-4</b>	CLASS A RUNWAY-CLEAR ZONE
<b>II-5</b>	CLASS B RUNWAY-AIRSPACE (ISOMETRIC)
<b>II-6</b>	CLASS B RUNWAY-AIRSPACE (PLAN & SECTIONS)
<b>II-7</b>	CLASS B RUNWAY-TYPICAL LAYOUT-SINGLE RUNWAY
<b>II-8</b>	CLASS B RUNWAY-TYPICAL LAYOUT-PARALLEL & CROSSWIND R/W
<b>II-9</b>	CLASS B RUNWAY-CLEAR ZONE (1500 FOOT WIDE PRIMARY SURFACE)
<b>II-10</b>	CLASS B RUNWAY-CLEAR ZONE (2000 FOOT WIDE PRIMARY SURFACE)
<b>II-11</b>	AIRSPACE-BASIC TRAINING OUTLYING FIELD (T-34 AIRCRAFT)
<b>II-12</b>	BASIC TRAINING OUTLYING FIELD (T-34 AIRCRAFT) AIRSPACE ISOMETRIC & CLEAR ZONE DETAIL





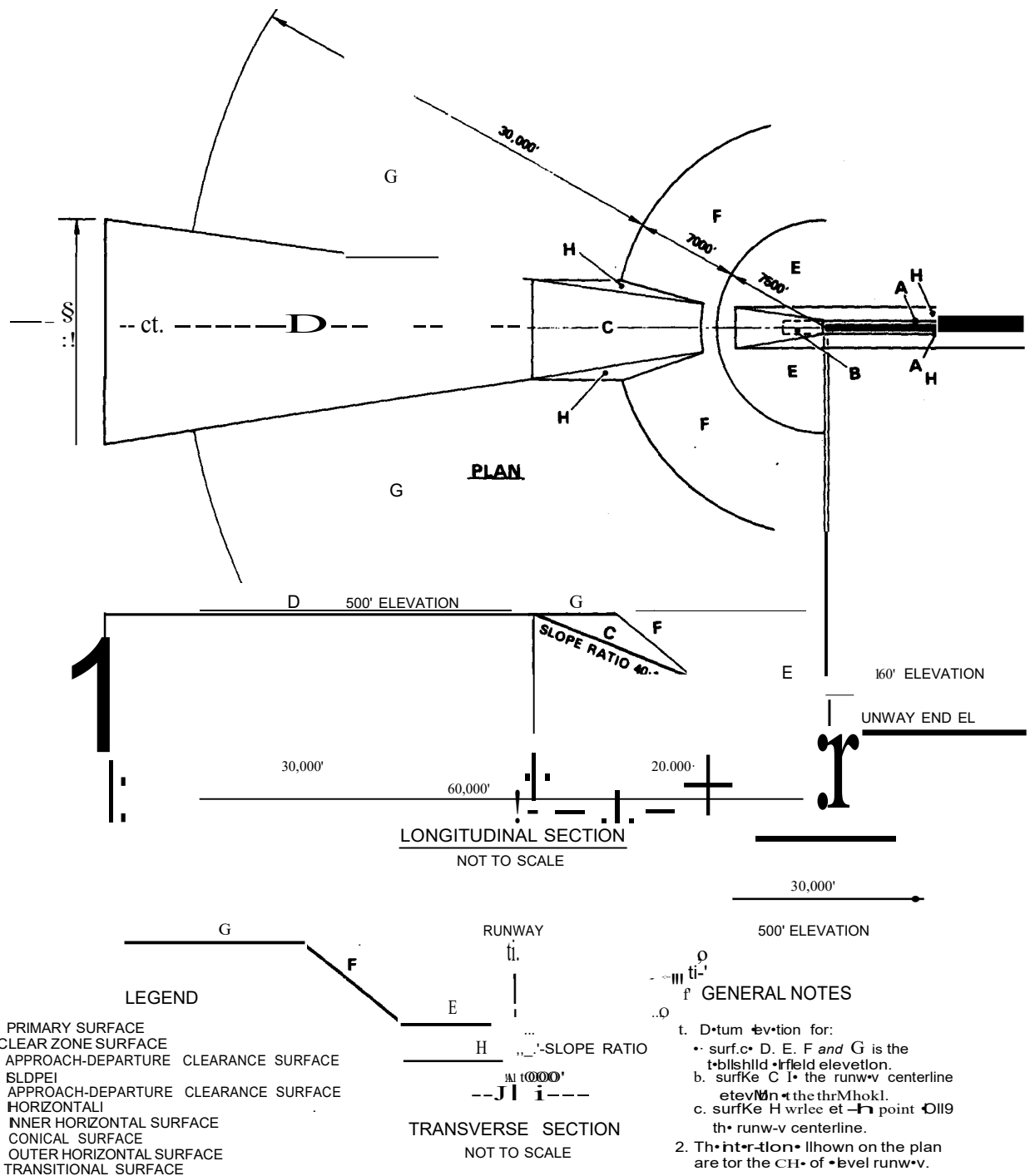
LEGEND

- A PRIMARY SURFACE
- B CLEAR ZONE SURFACE
- C APPROACH-DEPARTURE CLEARANCE SURFACE  
14:1 SLOPE RATIO
- D APPROACH-DEPARTURE CLEARANCE SURFACE  
1500' HORIZONTAL ELEVATION
- E INNER HORIZONTAL SURFACE 1150' ELEVATION
- F CONICAL SURFACE 20:1 SLOPE RATIO
- G OUTER HORIZONTAL SURFACE 1500' ELEVATION
- H TRANSITIONAL SURFACE 17:1 SLOPE RATIO

GENERAL NOTES

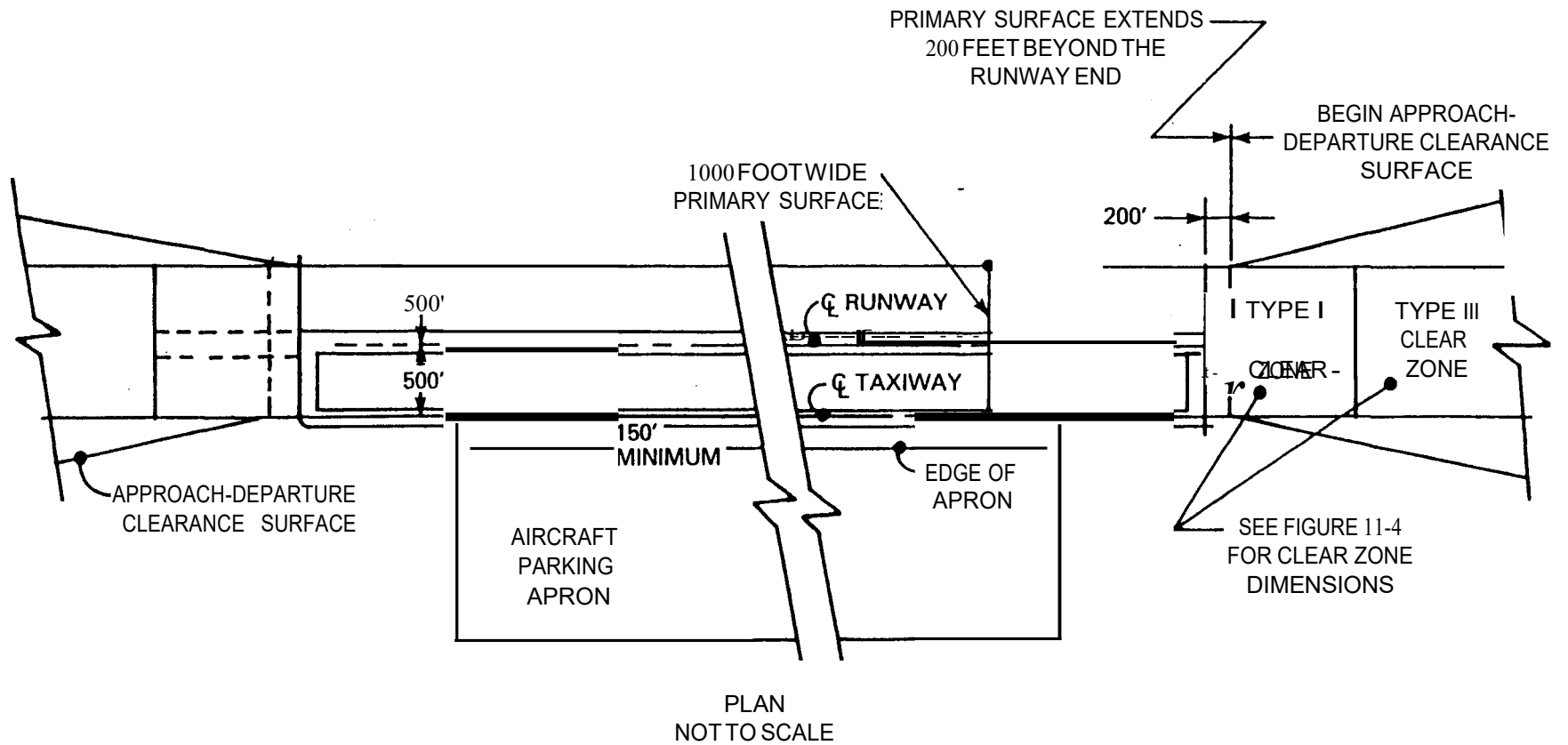
1. See Figure II-2 for Sections

FIGURE II-1  
CLASS A RUNWAY - AIRSPACE (ISOMETRIC)

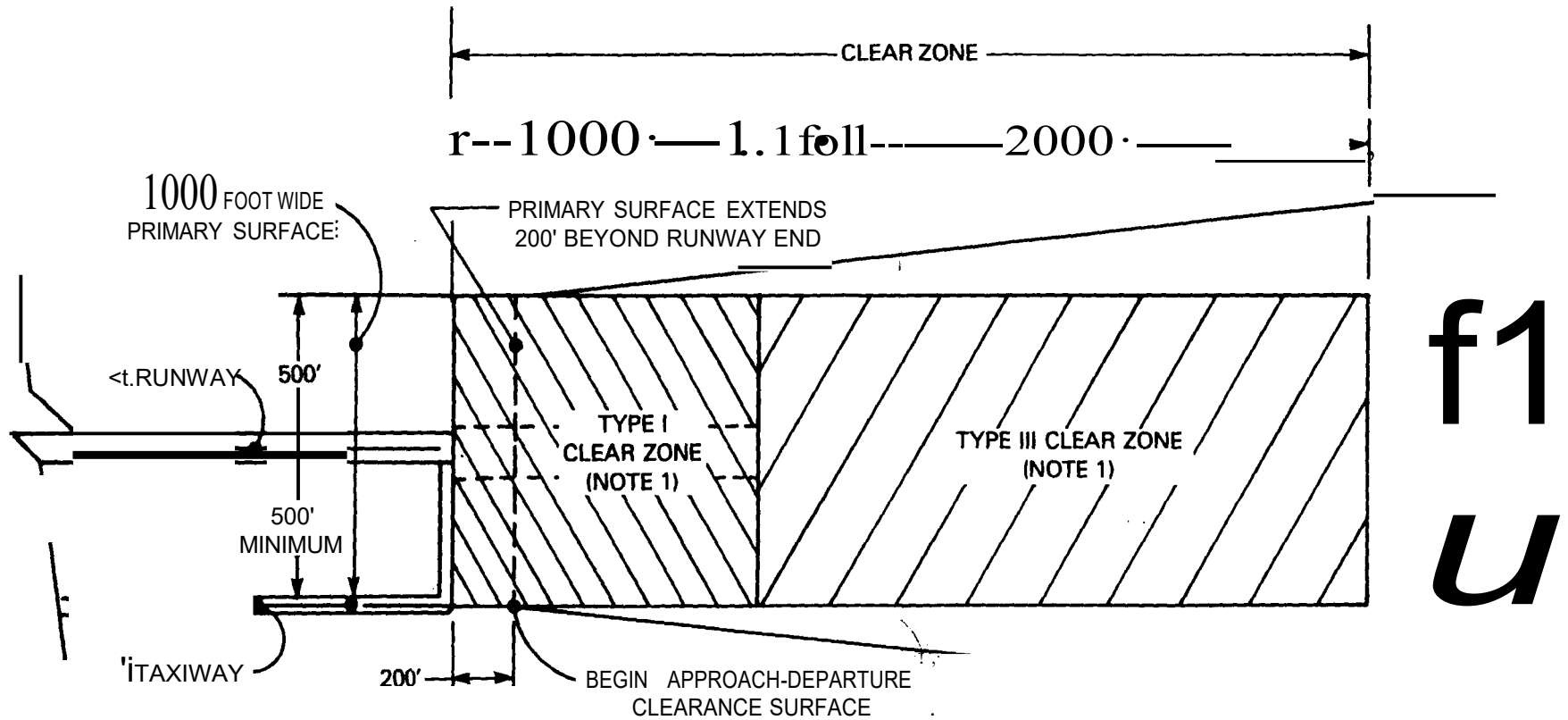


**FIGURE II-2**  
CLASS A RUNWAY-AIRSPACE (PLAN & SECTIONS)

11  
VI



f. FIGURE II-3.  
CLASS A RUNWAY (TYPICAL LAYOUT)



f1  
u

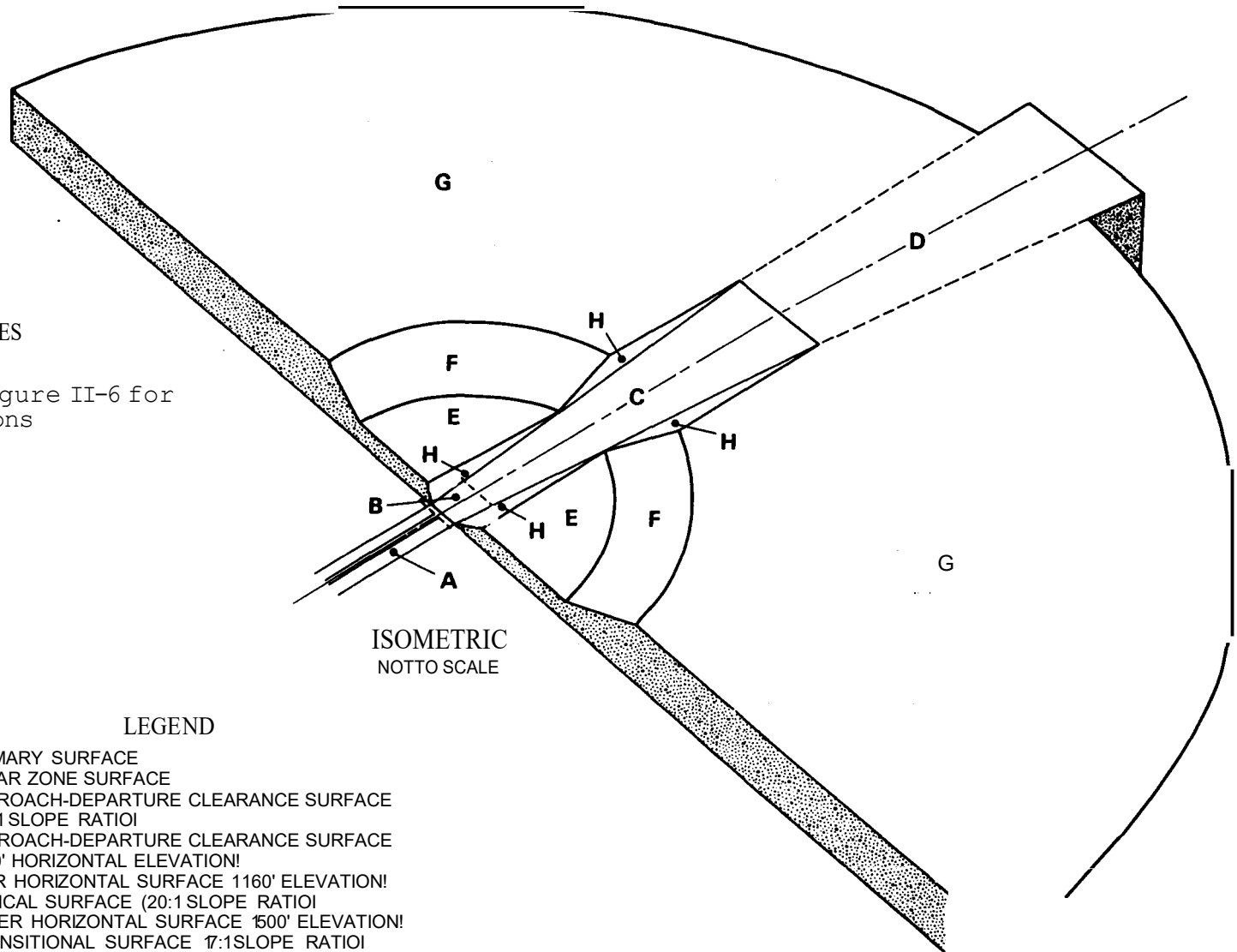
NOTES

- (1) See Section II, paragraph D for land use restrictions in the Type I and II clear zones.

FIGURE II-4  
CLASS A RUNWAY - CLEAR ZONE

GENERAL NOTES

1. See Figure II-6 for Sections

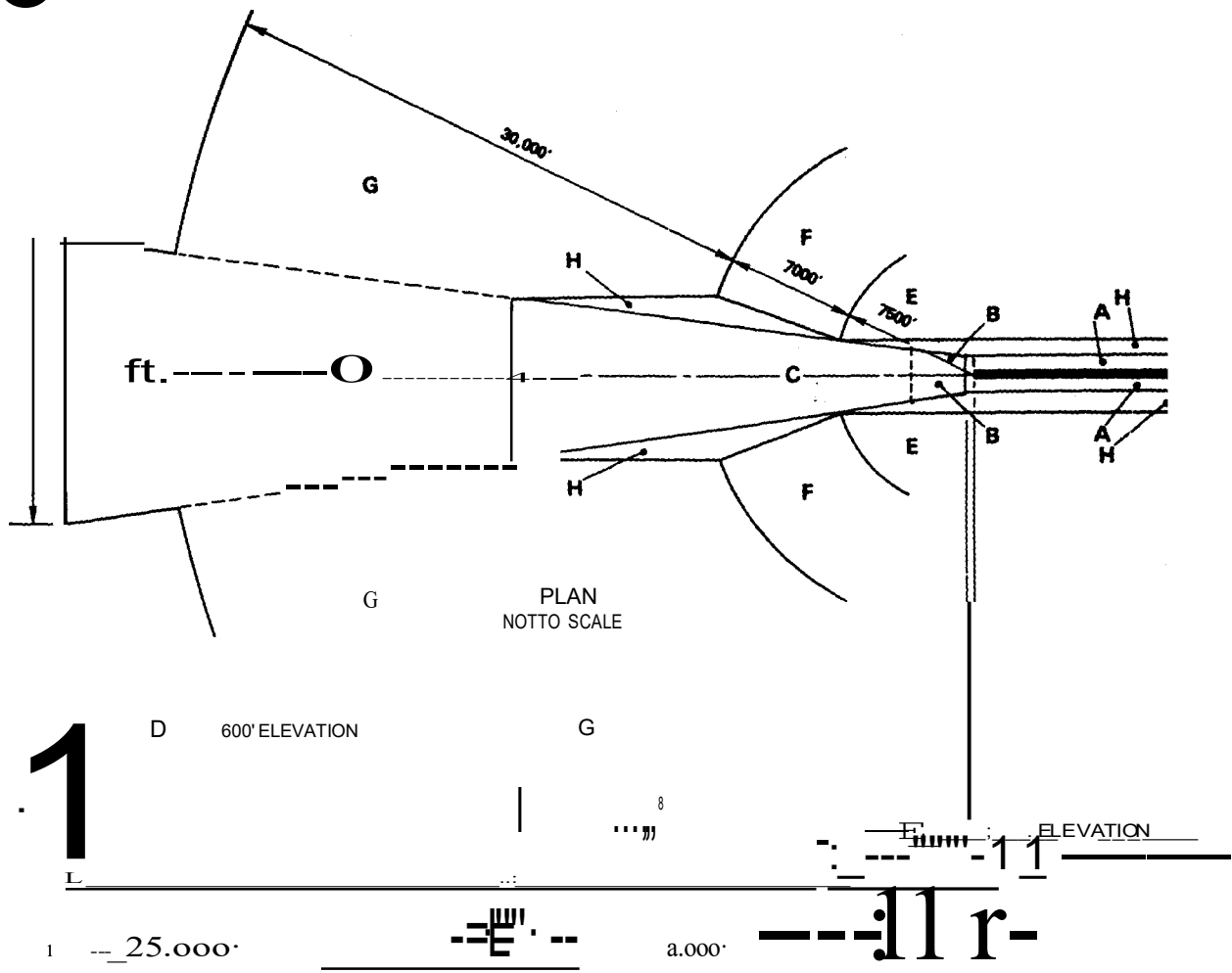


ISOMETRIC  
NOT TO SCALE

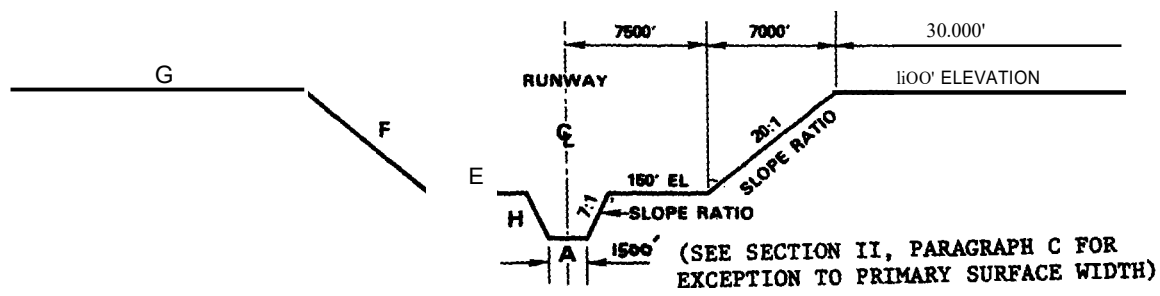
LEGEND

- A PRIMARY SURFACE
- B CLEAR ZONE SURFACE
- C APPROACH-DEPARTURE CLEARANCE SURFACE  
160:1 SLOPE RATIO!
- D APPROACH-DEPARTURE CLEARANCE SURFACE  
1500' HORIZONTAL ELEVATION!
- E INNER HORIZONTAL SURFACE 1160' ELEVATION!
- F CONICAL SURFACE (20:1 SLOPE RATIO)
- G OUTER HORIZONTAL SURFACE 1500' ELEVATION!
- H TRANSITIONAL SURFACE 17:1 SLOPE RATIO!

FIGURE II-5  
CLASS B RUNWAY - AIRSPACE (ISOMETRIC)



LONGITUDINAL SECTION  
NOT TO SCALE



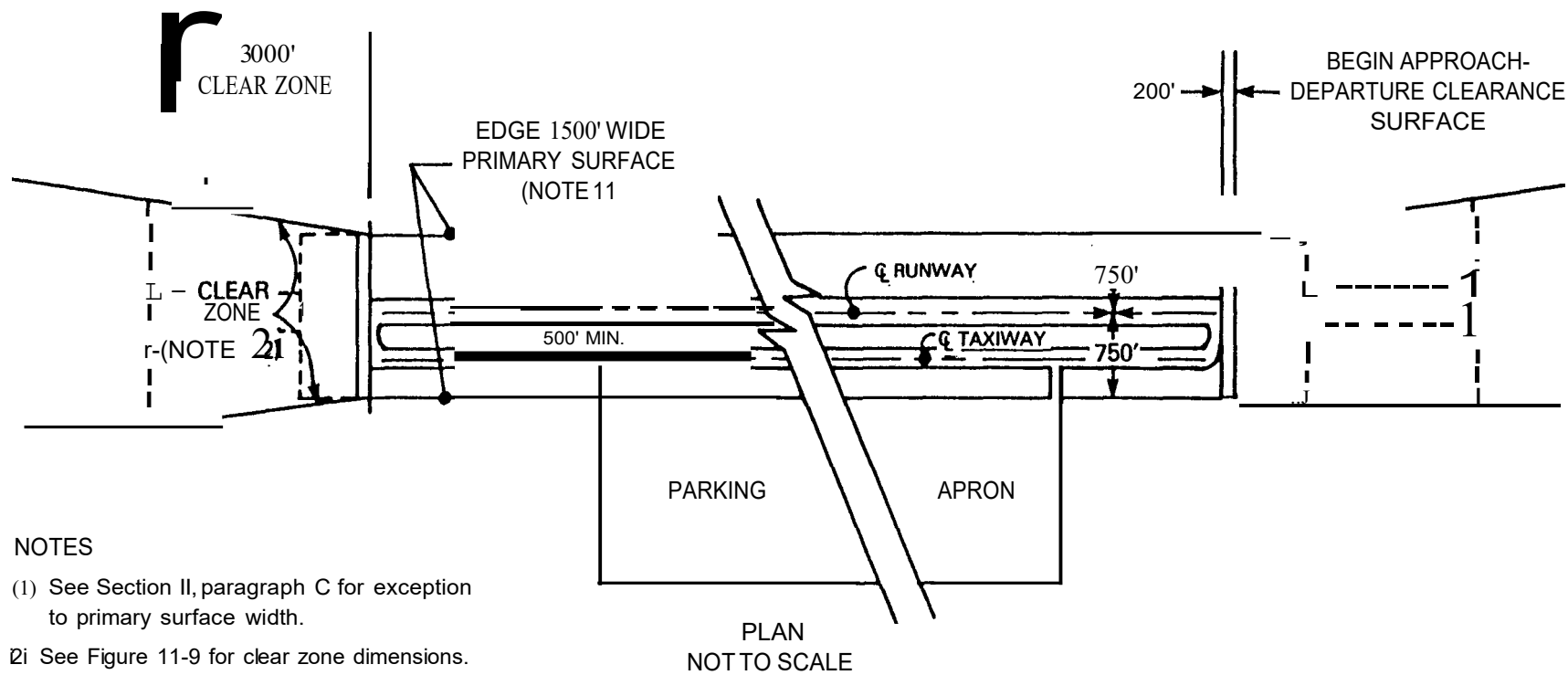
**LEGEND**

- A PRIMARY SURFACE
- B CLEAR ZONE SURFACE
- C APPROACH-DEPARTURE CLEARANCE SURFACE SLOPE
- D APPROACH-DEPARTURE CLEARANCE SURFACE HORIZONTAL
- E INNER HORIZONTAL SURFACE
- F CONICAL SURFACE
- G OUTER HORIZONTAL SURFACE
- H TRANSITIONAL SURFACE

**GENERAL NOTES**

1. Datum elevation for:
  - a. Surfaces D, E, F and G is the established field elevation
  - b. Surface C is the runway elevation at the threshold
  - c. Turf K is the elevation at each point along the runway
2. The intersection shown on the plan is for the center of a level runway.

**FIGURE II-6**  
CLASS B RUNWAY-AIRSPACE (PLAN & SECTIONS)



NOTES

- (1) See Section II, paragraph C for exception to primary surface width.
- 2i See Figure 11-9 for clear zone dimensions.

FIGURE II-7

CLASS B RUNWAY- TYPICAL LAYOUT - SINGLE RUNWAY

GENERAL NOTES

- THE LAYOUT SHOWN IS SCHEMATIC IN THAT IT ASSUMES THAT THE ENDS OF THE PARALLEL RUNWAYS ARE AT THE SAME ELEVATION. WHERE THE RUNWAY ENDS ARE AT DIFFERENT ELEVATIONS (OR IF THE RUNWAYS ARE STAGGERED), APPLY THE AIRSPACE CRITERIA TO EACH RUNWAY SEPARATELY AND THEN SUPERIMPOSE THE MAGINARY SURFACES FOR EACH RUNWAY. WHERE SURFACES OVERLAP, THE LOWER ONE GOVERNS.
- THE DATUM ELEVATION IS THE ESTABLISHED AIRFIELD ELEVATION.

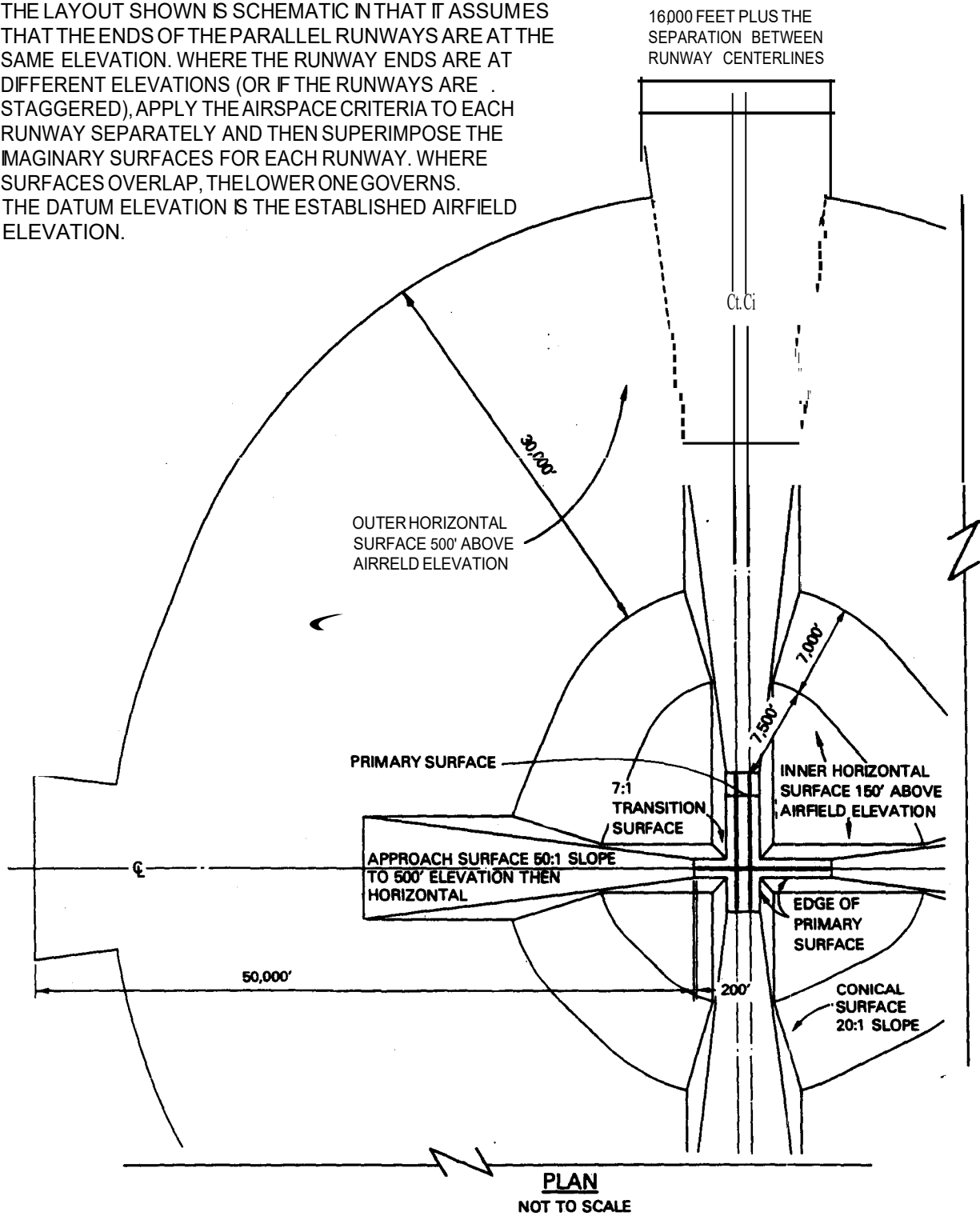
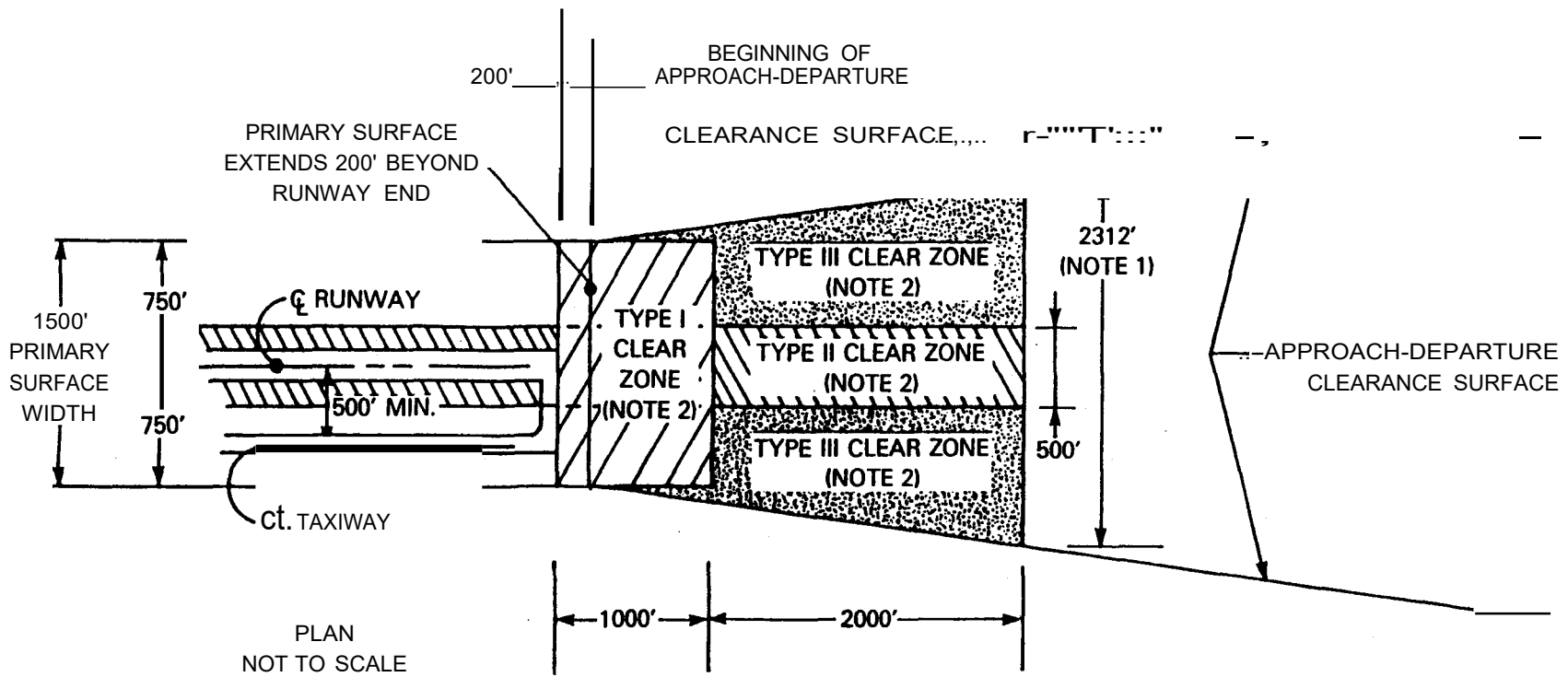


FIGURE II-8  
CLASS B RUNWAY - TYPICAL LAYOUT -  
PARALLEL & CROSSWIND RUNWAYS



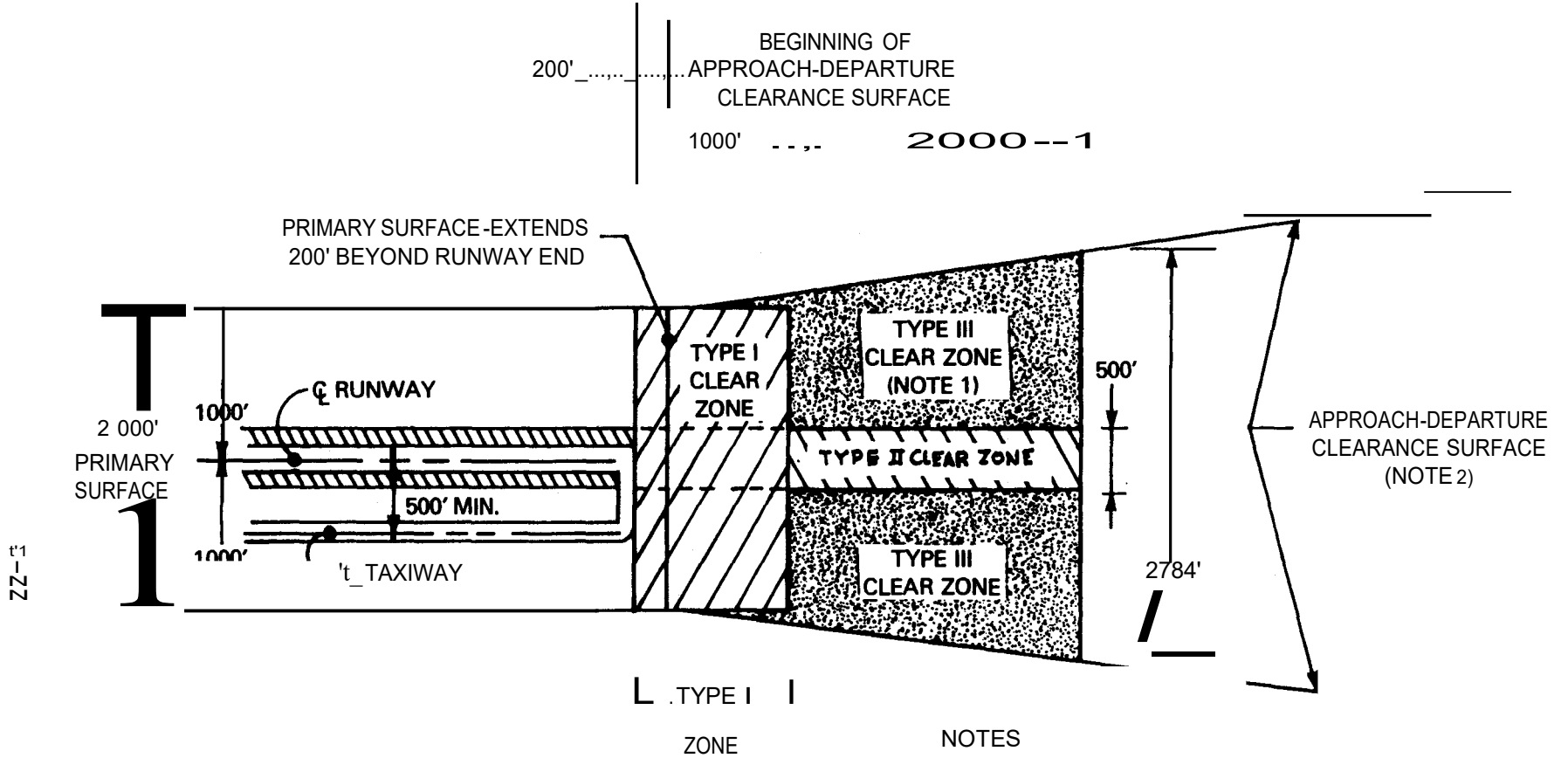
E-2



NOTES

- (1) This dimension is based on criteria herein which revises outer width of approach-departure clearance surface to 16,000 feet. At runways where the outer width has been established at 15,500 feet (based on previous criteria of 7°-58'-11" flare angle for approach-departure clearance surface), this dimension is 2284 feet.
- (2) See Section II, paragraph D for land use restrictions in Types I, II, and III clear zones.

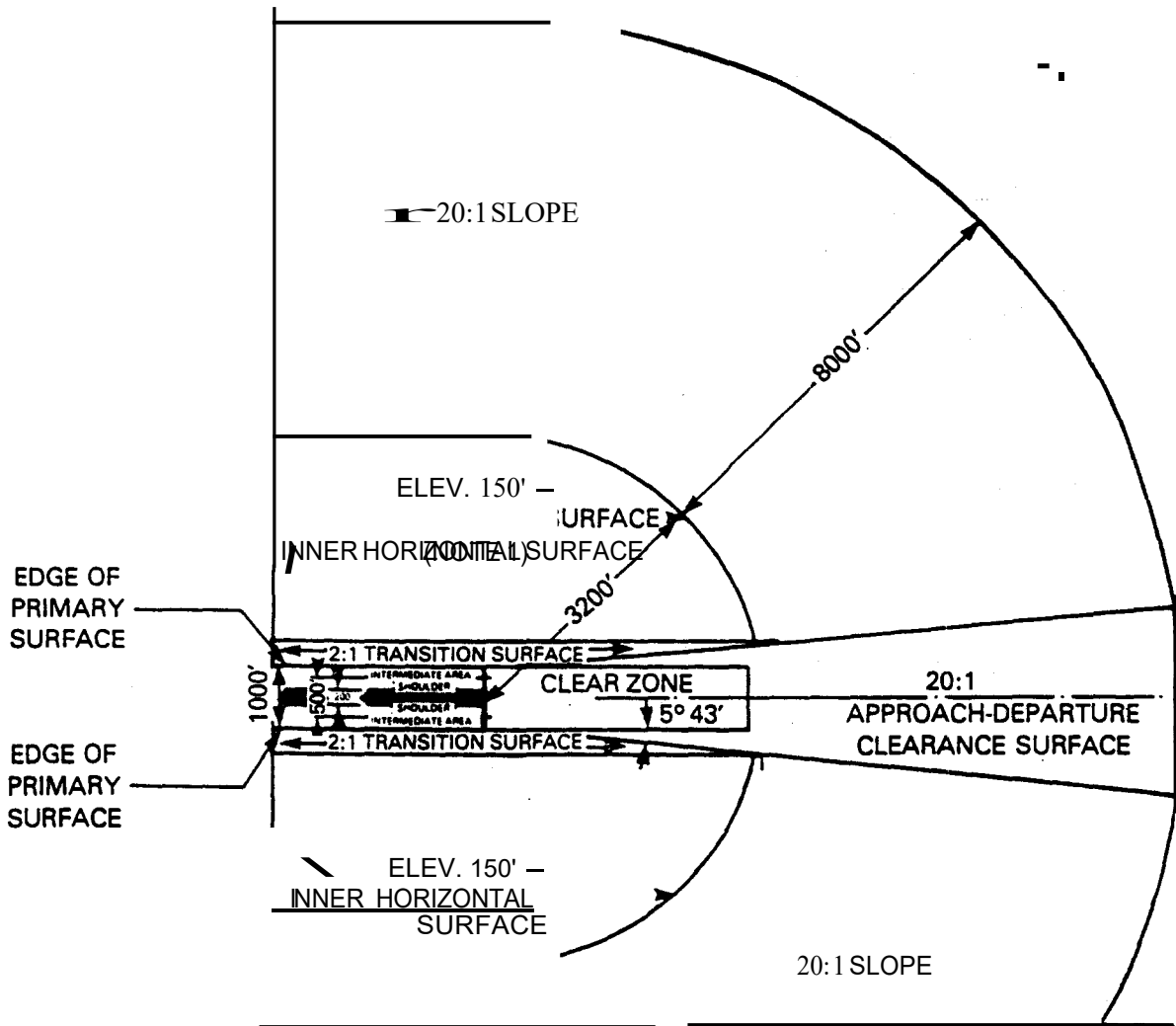
FIGURE II-9  
CLASS B RUNWAY - CLEAR ZONE  
(1500 WIDE PRIMARY SURFACE)



NOTES

- (1) See Section II, paragraph D for land use restrictions for Types I, II, and III clear zones and for possible variance from the dimensions shown.
- (2) The approach-departure clearance surface begins 200 feet from the runway end with a width of 2000 feet and flares outward to a width of 16,000 feet at a point 50,000 feet (measured horizontally) from its beginning.

FIGURE II-10  
 CLASS B RUNWAY - CLEAR ZONE  
 (2000 FOOT WIDE PRIMARY SURFACE)



NOTES

- (1) Inner horizontal surface elevation is 150 feet above the established airfield elevation.

PLAN  
NOT TO SCALE

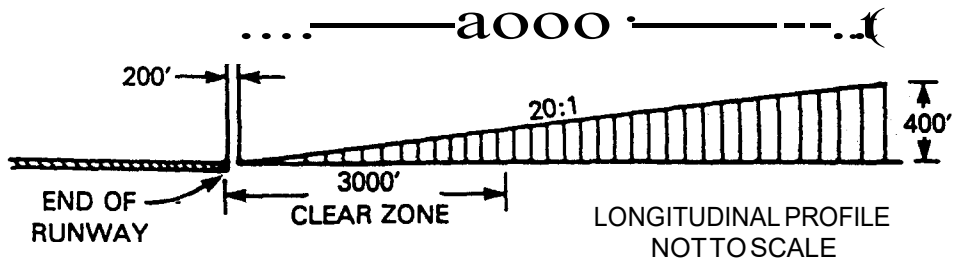
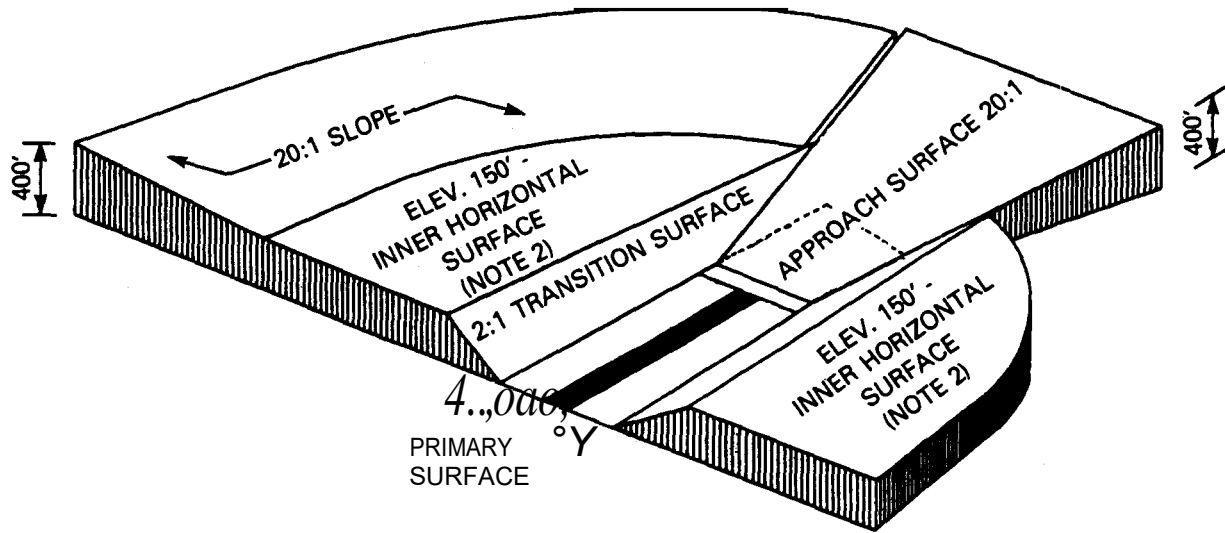
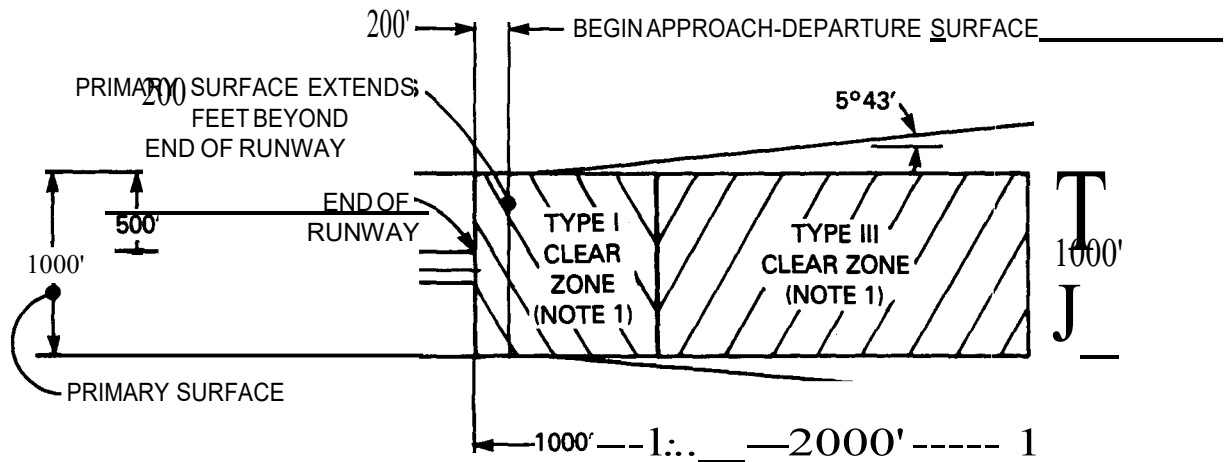


FIGURE II-11  
AIRSPACE-BASIC TRAINING OUTLYING FIELD  
(T-34 AIRCRAFT)



ISOMETRIC  
AIRSPACE/IMAGINARY  
SURFACES  
NOT TO SCALE



NOTES

- (1) See Section II, paragraph D for land use restrictions in Types land III clear zones.
- (2) Inner horizontal surface elevation is 150 feet above the established airfield elevation.

CLEAR ZONE  
DETAIL NOT TO  
SCALE

FIGURE II-12  
BASIC TRAINING OUTLYING FIELD T-34  
AIRCRAFT) AIRSPACE ISOMETRIC AND CLEAR  
ZONE DETAIL

SECTION III - AIRFIELD CLEARANCES - HELICOPTERS

A. TYPES OF FACILITIES. The major helicopter landing facilities consist of helipads and helicopter runways. The airspace clearances for helicopter facilities differ for Instrument Flight Rules (IFR) and Visual Flight Rules (VFR), therefore, the type of flight operations (IFR or VFR) must be identified before the obstruction standards may be applied.

B. OBSTRUCTIONS TO AIRSPACE. The standards for determining obstruction to air navigation for helicopter facilities are the same as specified for fixed wing aircraft in Section II, paragraph B, except that different imaginary surfaces are defined for helicopter facilities.

C. IMAGINARY SURFACES. The following imaginary surfaces are defined for helicopter facilities and are shown on the figures at the end of Section III:

1. Primary Surface. A horizontal plane symmetrically centered on the helicopter runway or helipad at the established elevation of the landing surface. The area beneath the primary surface (referred to as the primary surface area) shall be free of obstructions. The dimensions of the primary surface are:

'type Facility	Length of <u>Primary Surface</u>	Width of Primary Surface
VFR Helipad		, 150 FT
VFR Runway	• • 150 FT Runway length • • • plus 75 feet at each end	• 300 FT
IFR Helipad • •	• 1550 FT	.. 750 FT
IFR Runway (Single ,	• 1550 FT	.. 750 FT
GPI) (Note 1)		
IFR Runway (Double • •	• 2450 FT	• 750 FT
GPI) (Note 1)		

Note 1. The GPI (Ground point intercept) is the point on the centerline of the landing surface where the straight line extension of the glide slope intersects the approach surface baseline. For planning purposes, the GPI can be considered to be the helicopter touchdown point. The primary surface extends beyond the runway a distance of 775 feet from the GPI. The lengths shown are based on a single GPI at the middle of a 450 foot runway and a 1000 foot runway with two GPIs, each 50 feet in from the runway end.

2. Horizontal Surface (IFR only). A circular or oval level plane, located 150 feet above the established runway or helipad elevation, defined by scribing an arc with a 4,600 radius from the GPI. For multiple

GPI's, connect the arcs with tangents •



3. Transitional Surface. Planes that connect the primary surface and the approach-departure clearance surface and horizontal surface. Each surface is outward and upward from the edge of the primary surface or approach-departure clearance surface at a specified slope measured perpendicular to the runway centerline or helipad longitudinal centerline.

a. VFR Facilities. The slope ratio is 2:1 and for runways it rises to 150 feet above the established elevation of the landing surface. For helipads, the surface rises at a 2:1 slope until it reaches a horizontal distance of 250 feet from the centerline of the pad, it then rises vertically to an elevation of 150 feet above the established elevation of the landing surface.

b. IFR Facilities. The slope ratio is 4:1 and rises to the horizontal surface. At the intersection of the horizontal surface and the approach departure surface, it continues adjacent to the approach-departure clearance surface for the entire length, at which point an elevation of 375 feet above the approach-departure clearance surface is reached.

4. Approach-Departure Clearance Surface. An inclined plane which flares outward and upward above the runway or helipad longitudinal centerline extended. It starts at the end of the primary surface with the same width as the primary surface at the established elevation of the landing surface. The area under this surface is referred to as the approach - departure zone.

Type Facility	Width at Start	Width at End	Length	Slope
--4" VFR Helipad	150 FT	500 FT	1,200 FT	8:1 (Note 1)
VFR Runway	300 FT	600 FT	1,200 FT	8:1 (Note 1)
IFR Helipad and Runway	750 FT	8,000 FT	24,225 FT	25:1

Note 1. When VFR helicopter facilities are located such that they do not fall under the horizontal surface of a fixed wing runway or FR helicopter landing area, the approach departure surface shall be continued on an 8:1 slope until the minimum in route altitude is reached. The width for the extension of the surface shall be 500 feet for helipads and 600 feet for runways.

D. TAKE OFF SAFETY ZONE. A take off safety zone is required under the first 400 feet of VFR approach departure clearance surfaces. and has the same width as the approach-departure clearance surface. This safety zone shall be free of obstructions, rough, graded, and turfed where practical. Take off safety zones are not required at IFR facilities unless extensive primary surface provided for these facilities. An 800 foot long take-off safety zone is provided at Marine Corps Helicopter

Training Outlying fields, see Figure III-6.

E. LATERAL CLEARANCES. In order to insure the safe operation of helicopters on the ground, there are lateral clearances established for many airfield pavements. For example, no structures shall be sited within 100 feet of the edge of a fixed wing aircraft parking apron. The lateral clearances are listed in NAVFAC P-80 under the category code for the pavement to which they apply.

F. OTHER CONSIDERATIONS.

1. Air Installations Compatible Use Zones (AICUZ) Program. The AICUZ concept embodies a method of defining, quantifying and mapping aircraft noise, potential aircraft accident areas and existing or potential incompatible land uses, both on and off an air installation. AICUZ guidelines are specified in O FNAVINST 11010 .36 and apply to helicopter as well as fixed wing aircraft installations.

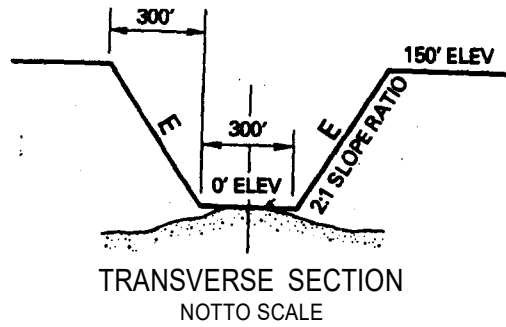
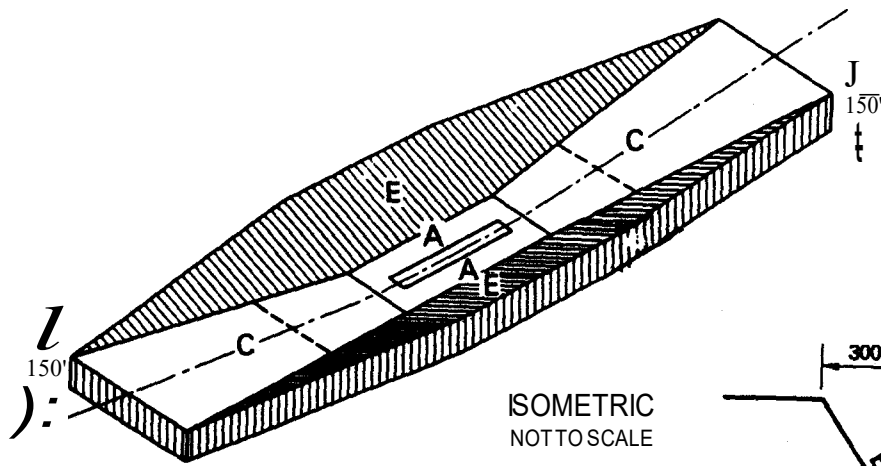
2. Airfield Explosives Prohibited Areas. The Naval Sea Systems Command has established criteria with respect handling and storing ammunition and explosives which are published in NAVSEA OP-5, Volume 1, Ammunition and Explosives Ashore. This publication addresses areas near runways and helipads and under flight paths where ammunition and explosives are prohibited and should be used for ordnance safety criteria.

G. DRAWINGS. The following figures are provided to illustrate the imaginary surfaces, typical helicopter facility layout and take off safety zones.

Figure	Title
III-1	VFR HELICOPTER RUNWAY-AIRSPACE
III-2	VFR HELIPAD-AIRSPACE
III-3	IFR HELIPAD/RUNWAY-AIRSPACE (ISOMETRIC)
III-4	IFR HELIPAD/RUNWAY-AIRSPACE (PLAN & SECTION)
III-5	IFR HELIPAD/RUNWAY-HUMAN SURFACE
III-6	MARINE CORPSES HELICOPTER OUTLYING FIELD (VFR)
Note (1)	III-7 BELICOPTER LANDING LANES-TYPICAL LAYOUT

Note (1) : Figure III-7 is included to show the spacing between multiple VFR touchdown points on a single runway and the separation between parallel VFR runways. The heliport configuration shown is for a typical Army staging field and should not be used for planning Navy /Marine Corps installations without the prior approval of the Naval Air Systems Command





LEGEND

- A PRIMARY SURFACE
- B TAKEOFF SAFETY ZONE
- C APPROACH-DEPARTURE CLEARANCE SURFACE  
1&1 SLOPE RATIO!
- D APPROACH-DEPARTURE ZONE
- E TRANSITIONAL SURFACE (2:1 SLOPE RATIO)

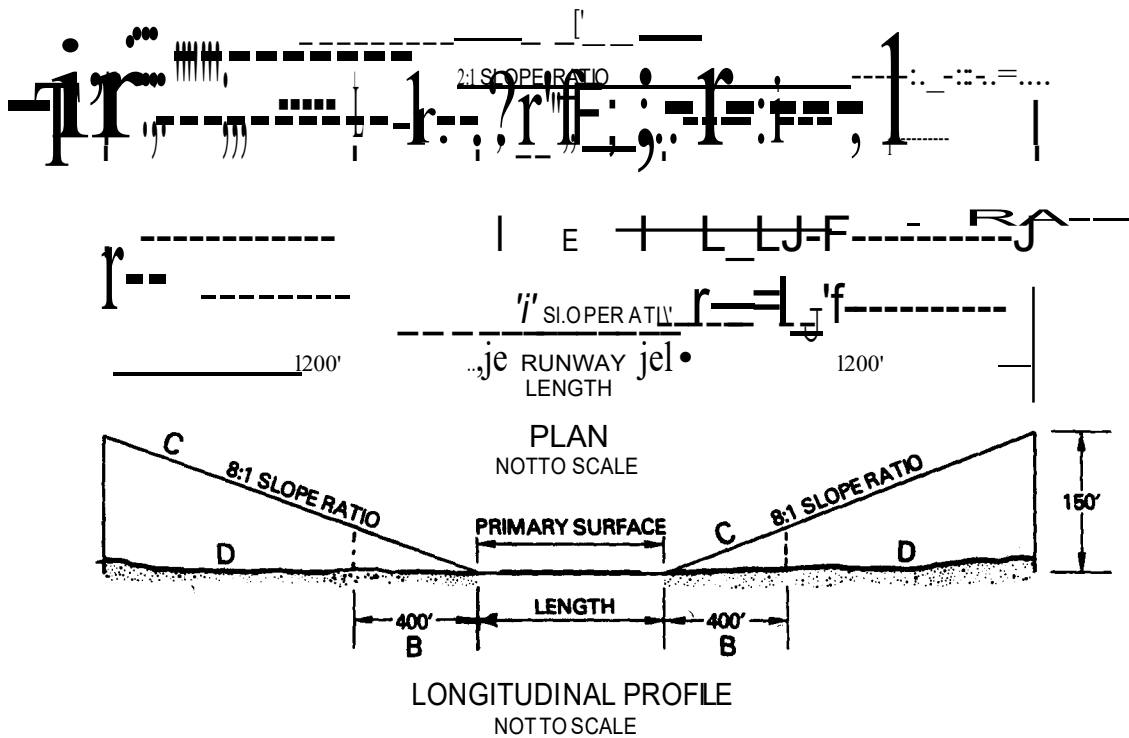


FIGURE III-1

C

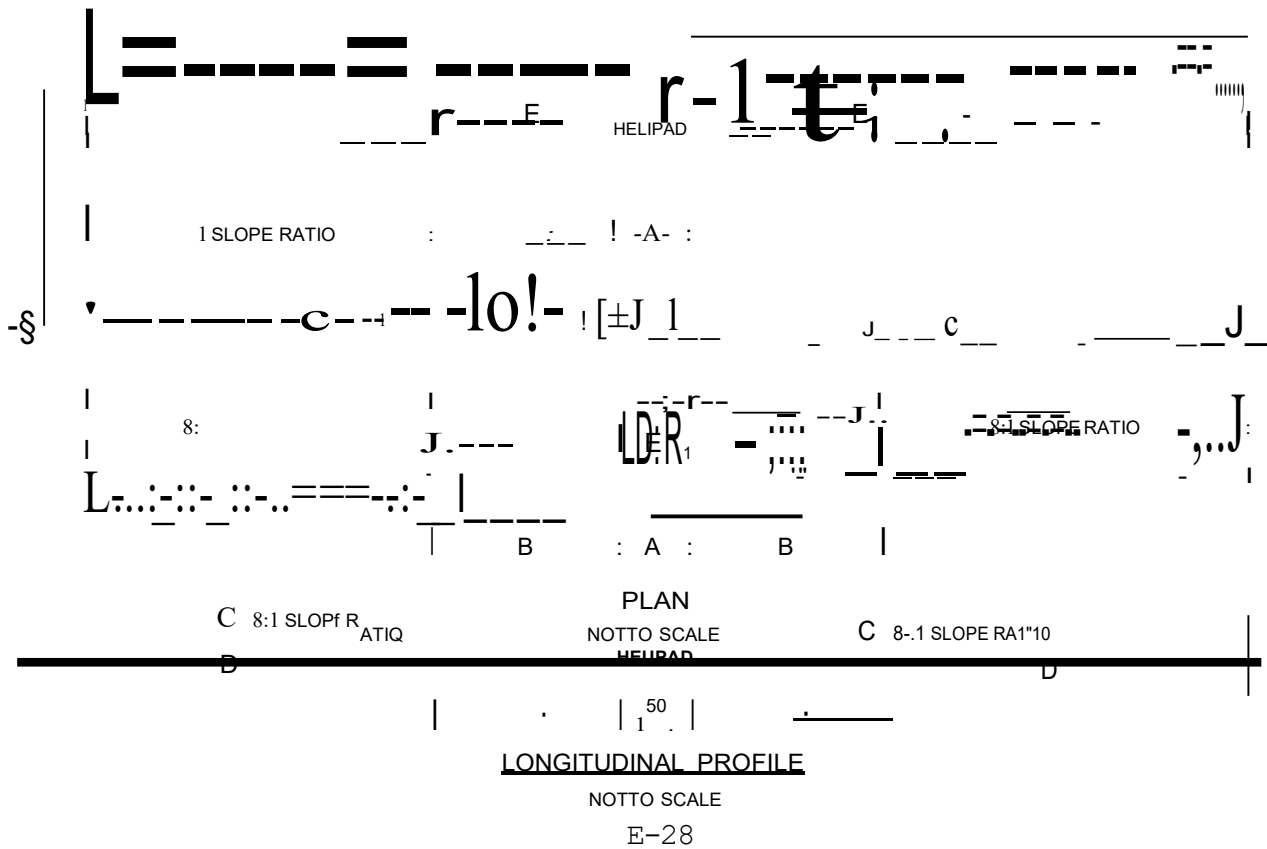
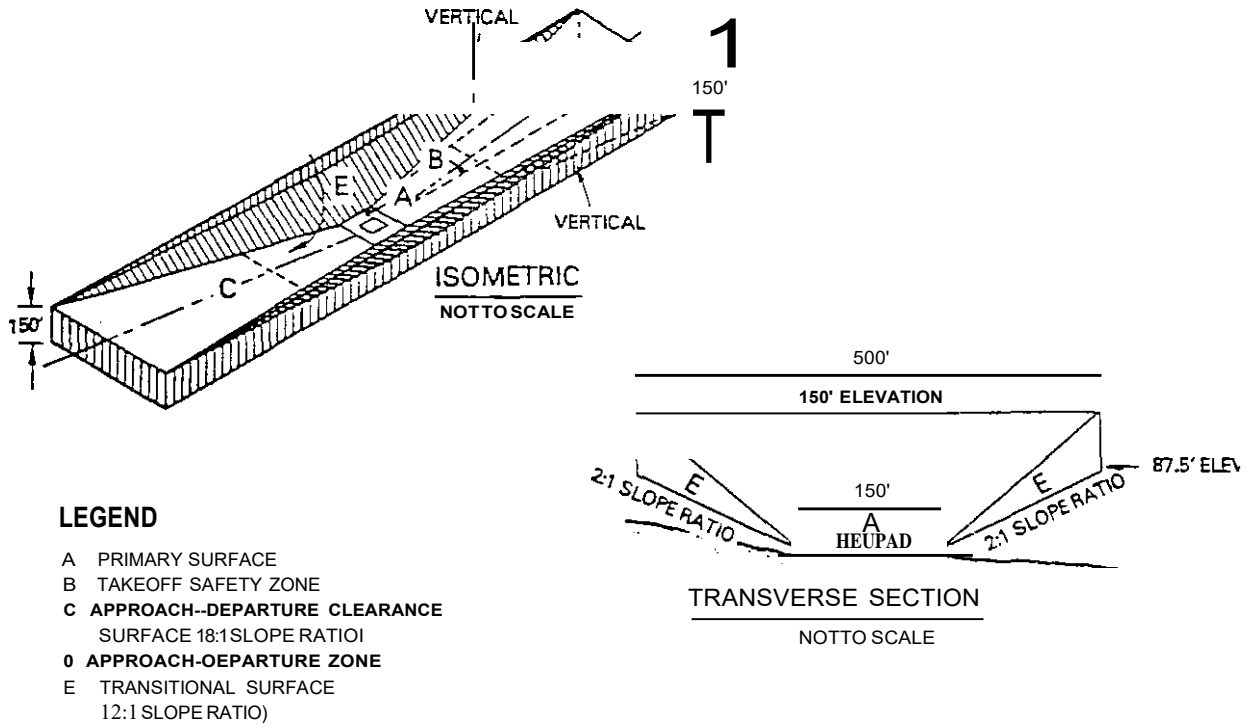
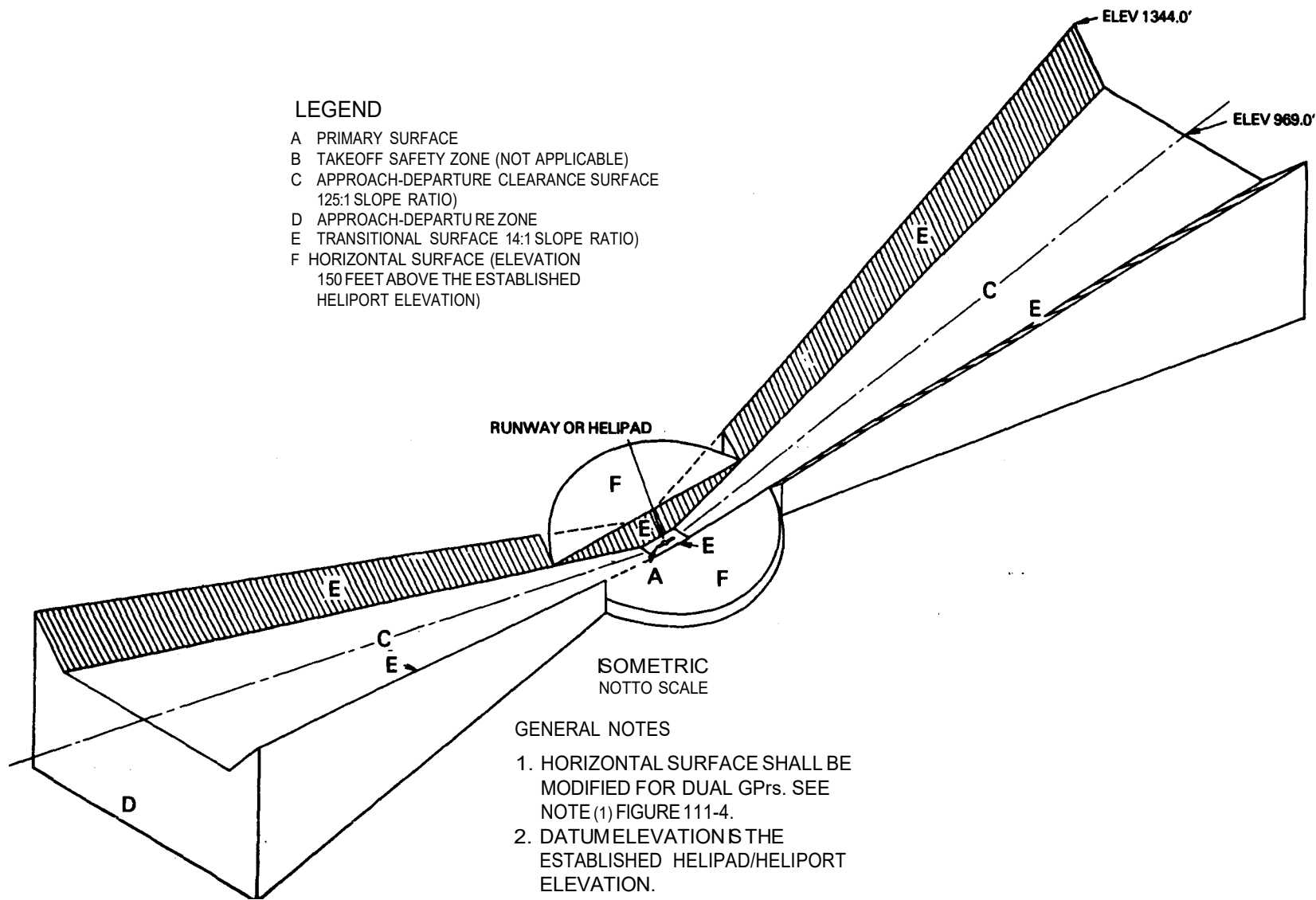


FIGURE III-2  
VFR HELIPAD - AIRSPACE

1:63  
.....  
O



**FIGURE III-3**  
IFR HELIPAD/RUNWAY AIRSPACE (ISOMETRIC)



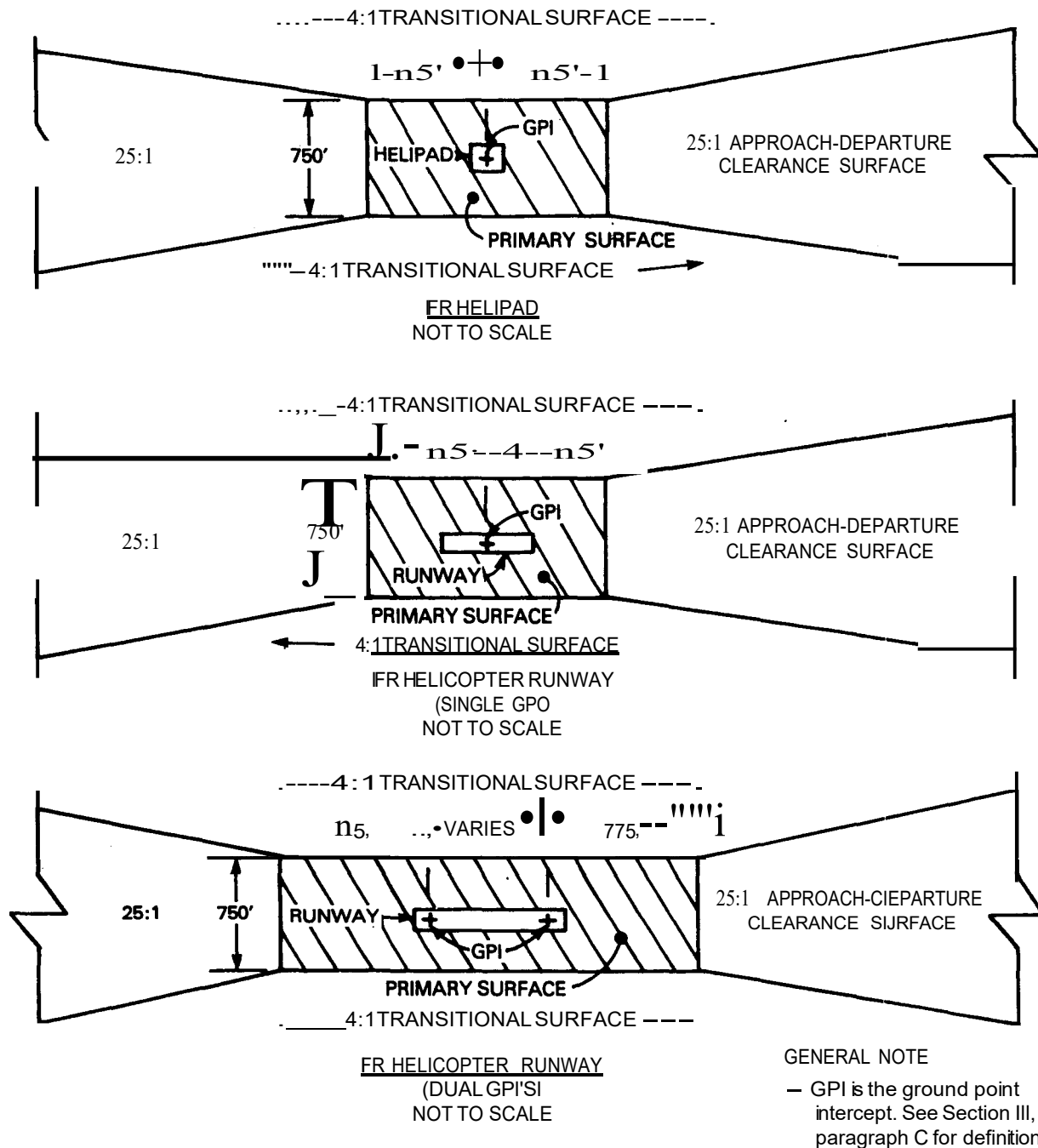
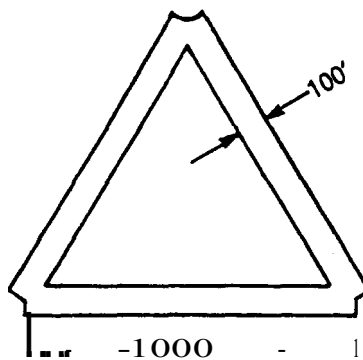
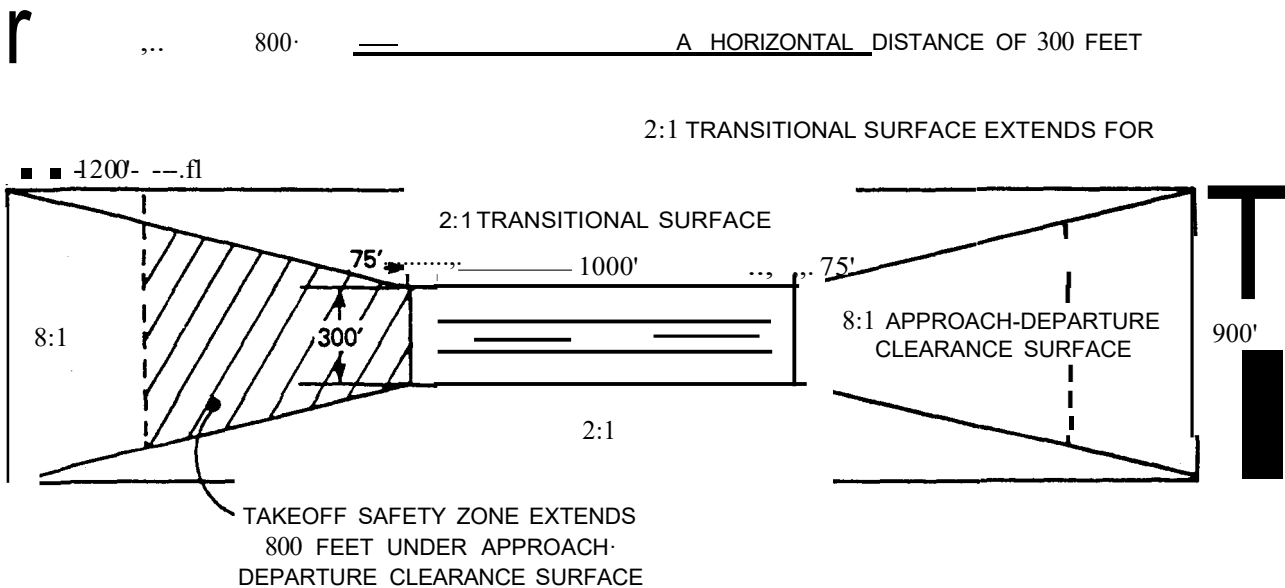


FIGURE III-5  
IFR HELIPAD/RUNWAY-PRIMARY SURFACE



1. THREE 1000 FOOT LONG RUNWAYS ARRANGED IN EQUILATERAL TRIANGLE
2. AIRSPACE SHOWN BELOW SHOULD BE APPLIED TO EACH RUNWAY

PLAN —  
SCHEMATIC NOT TO  
SCALE



TYPICAL AIRSPACE/IMAGINARY SURFACES  
 PLAN — NOT TO SCALE

FIGURE III-6  
 MARINE CORPS HELICOPTER OUTLYING FIELD  
 (VFR)



APPLY APPROACH-DEPARTURE CLEARANCE SURFACE  
AND TRANSITIONAL SURFACE CRITERIA AS SHOWN

FOR HELICOPTER VFR RUNWAY

8:1 SLOPE  
APPROACH-DEPARTURE  
CLEARANCE SURFACE

PRIMARY SURFACE LENGTH DETERMINED BY SIZE OF LANDING LANE

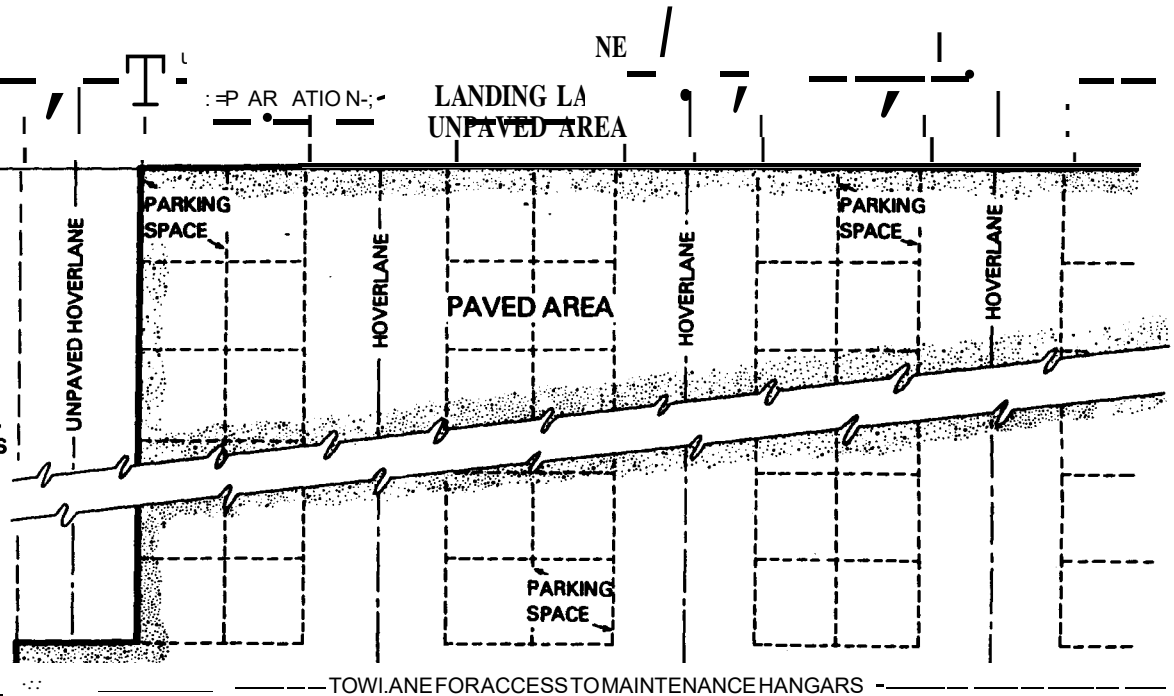
SERIES OF TOUCHDOWN POINTS, TREAT AS INDIVIDUAL HELIPADS, FOR SPACING, SEE NOTE 2

**NOTES**

1. WIDTH OF HOVERLANES AND PARKING SPACES IS DETERMINED BY THE TYPE OF HELICOPTER USED AND THE CLEARANCES REQUIRED.
2. INTERVAL BETWEEN TOUCHDOWN POINTS IS DETERMINED BY THE CENTERLINE DISTANCE BETWEEN HOVERLANES OR MINIMUM OF 400 FEET.
3. SIZE AND LAYOUT OF THE PARKING APRON VARIES WITH THE TYPE OF HELICOPTER USED AND THE MISSION REQUIREMENTS.
4. MINIMUM DISTANCE BETWEEN THE PRIMARY SURFACE AND THE APRON IS DETERMINED BY THE 2:1 TRANSITIONAL SURFACE CLEARANCE TO PARKED AIRCRAFT.
5. MULTIPLE LANES TO BE SPACED A MINIMUM OF 200 FEET CENTERLINE TO CENTERLINE.

**LEGEND**

 PAVING



NOT TO SCALE

**FIGURE III-7**

HELICOPTER LANDING LANES - TYPICAL LAYOUT



#### SECTION IV - LAND REQUIREMENTS

Land acquisition guidance for Navy and Marine Corps air installations is given in OPNAVINST 11010.36, Air Installations Compatible Land Use Zones (AICOZ) Program. The AICOZ land acquisition policies address the area beyond runways under flight paths. No policy is provided for the primary surface and laterally adjacent areas, which fall under the transitional surfaces. Land requirements in these areas are usually dictated by the requirement to site supporting facilities such as aprons, hangars, station buildings, etc. However as a minimum, the area within the primary surface and laterally out from the primary surface until the transitional surface is 50 feet above the ground should be controlled by fee purchase or restrictive easement. Fee purchase is preferred for the primary surface area.

\* U.S. GOVERNMENT PRINTING OFFICE: 1112 - J67-422/601

# **FACILITIES CRITERIA (FC)**

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## **FACILITY PLANNING FOR NAVY AND MARINE CORPS SHORE INSTALLATIONS**

### **APPENDIX F**

#### **AUSTERE FACILITIES (NAVY)**



**FACILITIES CRITERIA PROGRAM**  
**FACILITIES CRITERIA NAVY AND MARINE CORPS**  
**AUSTERE FACILITIES (NAVY) PLANNING CRITERIA**

**Record of Changes**

Change No.	Date	Location
1	05/01/2013	Revised <b>“FOREWORD”</b> by removing images of draft CNIC Instruction and providing hyperlink to CNIC document site; updated language in Introduction to focus on Planning functions; updated 61050-2 allowance for office GSF; updated 72127-3 and Table 72127-2 for space allowances in centralized bathrooms.
2	02/16/2017	CCN 721-27: Revised Title of CCN, revised CNIC N93 as POC to verify scope, replaced term “Lodging” with “Unaccompanied Housing” in correspond with N-code responsibilities within the CNIC organization.
3	01/10/19	Corrected Table 72235-A to correct typo error showing 151-200 capacity to 151-250 capacity.
4	06/12/2022	CNIC reference information is deleted under <b>“Description of Changes.”</b> CNIC broken link is removed under <b>“FOREWORD.”</b>
5	03/02/2023	Change UFC 2-000-05N to FC 2-000-05N document due to the fact that this planning criteria is not unified among the other DoD services.
6	03/17/2023	Change URLs to access the following: <ol style="list-style-type: none"> <li>1. Under 610-50, UFC 4-610-01</li> <li>2. Under 721-27, FC 4-722-10N</li> <li>3. Under 722-35, FC 4-722-01N</li> <li>4. Under 740-49, FC 4-740-02N</li> </ol>

**Description of Changes:**

The following significant changes were made in this UFC revision:

- Criteria updates and coordination align with references in UFC 4-610-01, FC 4-721-10N, FC 4-722-01N, and FC 4-740-02N.

## **FOREWORD**

This publication, “*Appendix F - Austere Facilities (Navy)*” is a supplement to FC 2-000-05N “*Facility Planning for Navy and Marine Corps Shore Installations*”, and provides facility planning criteria for use in computing quantitative austere facility requirements at specifically designated Navy installations.

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722 35 AUSTERE DINING FACILITY (SF) ..... 8

740 49 AUSTERE INDOOR PHYSICAL FITNESS CENTER (GYM) (SF) ..... 13

## **INTRODUCTION**

### **PURPOSE**

The purpose of this appendix is to provide planning guidance for developing Basic Facility Requirements (BFRs) for the following category code numbers (CCNs):

- CCN 610-50 Austere Administrative Facility
- CCN 721-27 Austere Unaccompanied Housing
- CCN 722-35 Austere Dining Facility
- CCN 740-49 Austere Indoor Fitness Center

### **DEFINITION AND SCOPE**

An austere facility is defined as a structure which has been planned, designed and constructed with minimal footprint area, infrastructure, and finishes, while incorporating the applicable building codes and facility criteria to assure adherence to all health, life safety, force protection, sustainability and accessibility standards and regulations necessary to fulfill the required mission.

Austere construction is intended for facilities in locations determined by CNIC and approved by OPNAV to be eligible for austere facilities construction. The austere standards are intended to be applied flexibly and in varying degrees to all facilities at locations designated as austere. The flexibility should be allowed to ensure the criteria are appropriate for individual austere locations.

Austere facilities should be built with the least total ownership costs (TOC) possible, including purchase, maintenance and use of consistently available alternative local goods.

### **APPLICABILITY**

This Appendix should be used for proper space planning of all facilities that are designated as austere during project programming by CNIC and OPNAV.

## 610 50 AUSTERE ADMINISTRATIVE FACILITY (SF)

For austere administrative facilities design criteria, refer to UFC 4-610-01 Appendix C, located here: <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-4-610-01>

### 61050-1 DEFINITION.

Austere administrative facilities accommodate the executive and staff functions at designated austere naval installations. The functions performed in an administrative office are primarily logistical and personnel management. These facilities are intended to provide the minimum footprint area and finish supporting administrative functions while providing minimal up front and total ownership costs in comparison to non-austere facilities.

Austere administrative buildings will be no more than two stories tall and do not include elevators. These facilities will utilize open office space layouts with provisions for a single private office and conference room.

Building size, shape, and area-to-perimeter ratio have a direct impact on the cost and efficiency of the facility, and all of these aspects should be considered during the planning phase. A simple shape with efficient structural layout and a high area-to-perimeter ratio yields the most economical facility.

**61050-2 BASIC PLANNING FACTORS.** The basic factors required to size austere administrative facilities are:

- The number of occupants, which drives the open office space requirement
- The special purpose rooms or spaces required

Note that all austere administrative space requirements below are provided in terms of Gross Square Feet (GSF).

**61050-2.1 Open Office Space.** The basic planning factor for open office space within an austere administrative facility is 80 GSF per building occupant. This figure includes all circulation spaces, hallways, bathrooms, mechanical rooms, electrical rooms and stairwells. Workstations/cubicles in austere administrative facilities shall be 6 x 8 ft (1.8 x 2.4 m). Requirements for special purpose rooms (shown below) are additive to the open office space requirement.

**61050-2.2 Special Purpose Rooms.** Any rooms/spaces not included as part of the open office space above, are to be considered as special purpose rooms/spaces. Examples of authorized spaces are listed below. Other types of special purpose rooms such as a SCIF, training room, or dedicated storage room must be individually justified based on mission requirements.

- Private office – 135 GSF



- Weather Vestibule - 64 GSF per vestibule
- Telecommunications/server room – 100 GSF per floor
- Administrative support space - includes space for photocopy machine space and work area, printers, files, facsimile machine space and work area, scanners, non-secured office supply storage, shredders, and safes.
  - File Area. An allowance of 7 GSF will be made per letter file cabinet, and 8 GSF per legal file cabinet.
  - Office Equipment. This category of space includes printers, copiers, shredders, fax machines, digital senders, and other similar equipment. The size is largely dependent on the number and types of machines used. Plotters should be considered in addition to the average square foot number used.
  - Safes. The space required will be dependent on the size and number of safes required.
- Conference Areas. Conference requirements must be carefully tailored to an organization's mission and experience, and then adjusted to take into consideration the availability of building conference facilities that can be shared. Based upon the number of building occupants, the following allowances should be made:

No. of Persons	Floor Area in GSF
8	160
Up to 14	280
Up to 24	480

**61050-3 ACCESS AND PARKING.** Access and parking is not authorized for Privately Owned Vehicles (POVs). Fire truck access and fire lanes are authorized. Service vehicle access is authorized for pickups, deliveries, maintenance, etc as needed. Minimal parking for official vehicles, particularly alternative modes of transportation such as electric vehicles is authorized where applicable. Access drives for pickup and drop off areas for shuttle buses, etc. are authorized. Total parking areas for residents, visitors, staff, and service personnel should be extremely minimal and limited to mission support.

## 721 27      **AUSTERE UNACCOMPANIED HOUSING (PN)**

For austere unaccompanied housing design criteria, refer to FC 4-721-10N Appendix E, located here: <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/fc-4-721-10n>.

**72127-1      GENERAL** Austere Unaccompanied Housing provides berthing facilities at enduring Naval installations that exclusively support missions in designated austere locations and are staffed with personnel on rotational deployments

Initial/preliminary requirements are determined by following the steps in section 72127-3 “Space Allowance”. Preliminary site selection is also performed during the initial planning phase.

Once the initial scope is determined, the findings are forwarded to CNIC (N93), for review. A subsequent independent assessment will be performed to determine the final project scope. This assessment will validate the site selection, determine the final number of rooms and minimal support areas necessary to meet the requirements of austere quarters, and identify any companion projects necessary to provide a complete and usable facility.

The space planning methodology included in this category code will accommodate the projected enduring and surge base population based on official loading and deployment projections relative to the unique nature of staffing with rotational personnel that will yield 90% average projected occupancy for the proposed facility/complex (see details under 72127-3 Space Allowance).

**72127-2      DEFINITION.** Austere unaccompanied personnel housing facilities will only be located at designated Naval installations. The current austere facility guidance provides for standardized room modules with centralized shower/toilet facilities for active duty personnel and reservists. The guidance in Section 72127-3 provides standardized room modules, with variable occupancy determined by the rank structure of the personnel occupying each module and the surge status of the installation.

Table 72127-1 provides a listing and description of all potential functional program areas for these facilities.

Table 72127-2 tabulates space requirements based on the installation population being served by the facility.

**Table 72127-1 Austere Quarters Functional Program Areas**

Functional Program Area	Description
<b>Resident Services (required)</b>	
Entrance vestibule	Entry airlock
Resident corridors/circulation	Access to guest rooms, toilets, showers and support areas.
Resident module <sup>1</sup>	Standard multi-occupant room with sleeping area, desks and clothes storage.
Centralized toilets & showers	Space provided in central, convenient location on each floor for resident access to toilets and showers.
<b>Facility Floor Support (required)</b>	
Janitorial areas	Janitor closet on each floor or wing.
Housekeeping areas	Housekeeping support and supplies on each floor or wing.
Utility rooms	Mechanical, electrical, communications and sprinkler rooms located for efficient utility distribution.
<b>Optional Support Areas (supporting justification necessary)</b>	
Laundry, linens	Spaces equipped with industrial-grade laundry equipment. Justified only for installations which do not provide a centralized laundry service.
Laundry, resident use	Spaces equipped for self-service resident laundry requirements. Justified only for installations which do not provide a centralized laundry service.
Linen storage, clean	Storage area for distribution of clean linens.
Linen storage, soiled	Storage area for soiled linens, adjacent to receiving area or laundry spaces.
Receiving	Service entrance for equipment and service supplies.
Reception	Reception desk for check-in and check-out. Justified only for installations which do not have a centralized billeting assignment office.
Storage, cleaning fluid	Separate storage for chemicals used for cleaning, etc.
Storage, general supply	Storage and warehousing of facility supplies.

<sup>1</sup> The final number of rooms will be determined through individual assessment by CNIC/N9.

**72127-3 SPACE ALLOWANCE.** Berthing modules under CCN 72127 are intended for variable occupancy depending on the rank of the occupants. Each standard module has 288 net square feet (NSF) of living/sleeping area. The maximum steady-state (non-surge) occupancy per module is four persons, resulting in a minimum 72 NSF per person.

For planning purposes, the steady-state module occupancy standards are:

- 4 persons per module ----- (72 NSF per person)----- E1 through E6
- 2 persons per module ----- (144 NSF per person)----- E7 through E8
- 2 persons per module -----WO1 through WO4
- 2 persons per module ----- O1 through O4
- 2 persons per module -----Civilian equivalent
- 1 person per module ----- (288 NSF per person)-----E9
- 1 person per module ----- WO5
- 1 person per module ----- O5 and above
- 1 person per module -----Civilian equivalent

Refer to the space allowances shown in Table 72127-2 to obtain a comprehensive facility size. For initial planning purposes, allow for all required austere spaces shown in Table 72127-1. Omit the optional support areas shown in the table, unless justified by the lack of centralized services located elsewhere on the installation (include justification in the project documentation) .

Initial project scope is determined by actual loading capacity requirement (i.e., the number of personnel needing housing for a given steady-state period). Austere berthing facilities should be planned for a 90% occupancy rate. The modules will accommodate the use of bunks to allow for doubled maximum occupancy during periods of temporary population surge.

The facility shall incorporate space on each floor for interior, centralized toilets and showers sufficient for the planned steady-state population. The initial project scope shall provide for one water closet with lavatory per 10 persons allowing 30 NSF per wc/lavatory, and one shower per 8 persons allowing 20 NSF per shower.

No space allowances shall be provided for common gathering areas or kitchen spaces. Elevators are not authorized. Provide a concrete pad and removable railing section for each floor above the pad for use of a portable lift for the movement of furniture to upper floors.

**72127-4 ACCESS AND PARKING.** Access and parking is not authorized for Privately Owned Vehicles (POVs). Fire truck access and fire lanes are authorized. Service vehicle access is authorized for pickups, deliveries, maintenance, etc as needed. Minimal parking for official vehicles, particularly alternative modes of transportation such as electric vehicles is authorized where applicable. Access drives for pickup and drop off areas for shuttle buses, etc. are authorized. Total parking areas for residents, visitors, staff, and service personnel should be extremely minimal and limited to mission support.

**Table 72127-2. Space Allowances for Austere Quarters**

Functional Program Area	Base Area		Space Standard (planning factor)	Description	Sample (see notes)		
	ft <sup>2</sup>	m <sup>2</sup>			Req't	NSF	NSM
Entrance Vestibule	100	9.3	Per facility	Standard size	Req'd	100	9.3
Standard Resident Module	288	26.8	Standard 4-person berthing module		Req'd	51,840	4,816.1
Central Gang Toilet/ Shower	50	4.6	Water Closet and Lavatory = 30 NSF @ 1 per 10 PN Shower and drying area = 20 NSF @ 1 per 8 PN	Based on information in UFC 3-420-01 and UFC 4-740-03	Req'd	3960	367.9
Janitor Areas	25	2.3	Per Facility floor wing	Includes mop sink, janitor supplies and equipment	Req'd	75	7.0
House-keeping Areas	50	4.6	Per Facility floor wing	Accommodates housekeeping supplies and storage	Req'd	150	13.9
Utility Rooms	16	1.5	Per 25 modules	Comm. rooms only; other utility rooms are included in net-to-gross multiplier	Req'd	128	11.9
Laundry, Linen	450	41.8	Optional facility space at 450 SF for up to 25 modules + 4 SF per ea additional module	Only authorized when no centralized laundry service is available at the installation.	Opt.	0	0.0
Laundry, Resident	110	10.2	110 NSF per 10 modules	Two to four washers and two to four dryers per every 10 room modules	Opt.	0	0.0
Linen Storage, Clean	150	13.9	25 NSF per 16 modules	Shelving	Opt.	0	0.0
Linen Storage, Soiled	100	9.3	100 NSF +15 NSF per 10 modules	Includes carts and sorting space	Opt.	0	0.0
Receiving	150	13.9	150 NSF	Service entrance to receive goods and equipment	Opt.	0	0.0
Reception Desk	64	5.9	64 NSF	Desk area to assign rooms and issue linens. Allowed if central billeting not used on installation.	Opt.	0	0.0
Storage, General Supply	600	55.7	600 NSF	Includes segregated space for cleaning fluid storage	Opt.	0	0.0
<b>Sample Subtotal</b>						<b>56,253</b>	<b>5,226.1</b>
<b>Net-to-Gross Factor @ 30%</b>						16,876	1,567.8
<b>Sample Total</b>						<b>73,129</b>	<b>6,793.9</b>
Notes: 1. Sample is for a 180 module, three floor facility. 2. The "Req't" column indicates whether or not space is authorized for designated austere facilities.							

## 722 35 AUSTERE DINING FACILITY (SF)

For Austere Dining Facilities design criteria, refer to FC 4-722-01N Appendix C, located here: <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/fc-4-722-01n>.

**72235-1 GENERAL.** Austere dining facilities shall provide for cafeteria style feeding of short order and regular meals much like traditional facilities, but with reduced footprint and finish requirements.

**72235-2 DEFINITION.** Austere dining facilities provide core dining, food preparation, and support areas for locations determined austere by CNIC. These facilities are intended to provide the minimum footprint area and finishes to support galley functions while providing minimal up front and total ownership costs in comparison to non-austere locations.

**72235-3 SPACE ALLOWANCE.** Projects are subject to review by Naval Supply Systems Command and subsequently by DOD Food Planning Board. Austere dining facility requirements are generated in two basic steps: (1) Determination of the installation dining loading, and (2) Determination of space allowances using Table 72235-A.

### Step 1 – Determination of Installation Dining Loading

**72235-4** The number of personnel to be served during a meal period shall be determined by multiplying the maximum military, authorized civilian, and authorized contractor installation population by the austere utilization factor of 90%. Personnel on separate rations shall not be included in the serving requirements when planning new dining facilities, or retaining and modernizing permanent facilities. Include the average on-board count of crews of ships entitled to rations-in-kind while shipboard dining facilities are out of service in the projected occupancy figure.

### Step 2 – Determination of Space Allowances

**72235-5 FUNCTIONAL COMPONENTS.** The authorized floor areas are based on the number of personnel to be served as determined by Step 1. The facility size shall conform to Table 72235-A. The following assumptions have been made in the planning methodology contained herein:

- For austere facility dining, seating is based on 12 SF (1.1 SM) per seat.
- Three meals per day are served, seven days per week as a minimum.
- Bussing method is self-buss to remote dish room.
- The service capacity of a properly equipped and manned regular meal serving line will sustain a service rate of eight personnel per minute. A properly equipped and manned short-order to-order serving line will sustain a service rate of five personnel per minute.

- Seating capacity is traditionally determined by dividing the total number of patrons to be served by the turnover rate. Turnover rates can vary according to the size of facility and seating capacities. Table 72235-A lists the turnover rates upon which each facility size has been based. For situations that require variations in the turnover rate, the space allowances must be adjusted accordingly. See UFC 4-722-01 for more information on turnover rates and minimum seating capacity.
- The local command determines the meal period.
- For planning purposes the total service time should not be less than 72 minutes or more than 142 minutes.

**72235-6 STORAGE.** Storage area requirements shall be calculated as 20% of the facility subtotal (see Table 72235-A) and shall include areas for the storage of dry foods, refrigerated and frozen foods, consumables, and other non-food goods. Storage areas may be integral to the dining facility or may be stand-alone facilities in appropriate environments, but are included in the dining facility square footage and do not warrant a separate property record card. Storage allowance may be increased based on remote locations with longer delivery cycles, but must be justified by the user and approved by CNIC/N9.

**72235-7 NET TO GROSS FACTOR.** The net-to-gross multiplier accounts for mechanical and other utility space, wall thicknesses and structural columns, and common areas throughout the building. For planning purposes, apply a net-to-gross factor of 1.25 to the facility subtotal (see Table 72235-A).

**72235-8 SPACE ALLOWANCE TABLE.** The area allowances shown in Table 72235-A on the following pages are provided for various dining facility sizes based on population to be served (see 72235-4). Total size of a facility shall be based on the number of personnel served as shown at the top of each of the following tables. NOTE: The facility total allowances shown include provisions for a flight kitchen. If this space is not applicable, deduct the appropriate allowance from the facility total.

**TABLE 72235-A  
SPACE CRITERIA FOR AUSTERE DINING FACILITIES**

Functional Components		Facility Size Classifications							
		1-80		81-150		151-250		251-400	
		Personnel Served		Personnel Served		Personnel Served		Personnel Served	
		62 Min. Seats		108 Min. Seats		116 Min. Seats		172 Min. Seats	
		1.3 Max Turnover		1.4 Max Turnover		2.2 Max Turnover		2.3 Max Turnover	
		NSF	SM	NSF	SM	NSF	SM	NSF	SM
PUBLIC AREAS	Dining and Circulation	750	69.7	1305	121.2	1500	139.4	2400	223.0
	Public Toilets	180	16.7	200	18.6	220	20.4	250	23.2
	Queue	130	12.1	250	23.2	325	30.2	500	46.5
	Sign-in Station	40	3.7	40	3.7	40	3.7	60	5.6
	<b>Subtotal</b>	<b>1100</b>	<b>102.2</b>	<b>1795</b>	<b>166.8</b>	<b>2085</b>	<b>193.7</b>	<b>3210</b>	<b>298.2</b>
SERVING AREAS	Regular Food Line	250	23.2	320	29.7	0	0.0	0	0.0
	Fast Food Line	0	0.0	0	0.0	0	0.0	0	0.0
	Combination Food Line	0	0.0	0	0.0	420	39.0	620	57.6
	Beverage Line	200	18.6	250	23.2	350	32.5	500	46.5
	Dish Washing	180	16.7	250	23.2	320	29.7	380	35.3
	<b>Subtotal</b>	<b>630</b>	<b>58.5</b>	<b>820</b>	<b>76.2</b>	<b>1090</b>	<b>101.3</b>	<b>1500</b>	<b>139.4</b>
PREP AREAS	Kitchen	520	48.3	640	59.5	655	60.9	880	81.8
	Utensil Wash	0	0	0	0	175	16.3	220	20.4
	<b>Subtotal</b>	<b>520</b>	<b>48.3</b>	<b>640</b>	<b>59.5</b>	<b>830</b>	<b>77.1</b>	<b>1100</b>	<b>102.2</b>
SUPPORT AREAS	Offices	106	9.8	106	9.8	212	19.7	212	19.7
	Staff Toilets	260	24.2	260	24.2	260	24.2	260	24.2
	Staff Lockers	0	0	0	0	120	11.1	160	14.9
	Janitor's Closet	25	2.3	25	2.3	25	2.3	50	4.6
	Can Wash	40	3.7	40	3.7	40	3.7	40	3.7
	Loading Dock	400	37.2	400	37.2	400	37.2	460	42.7
	<b>Subtotal</b>	<b>831</b>	<b>77.2</b>	<b>831</b>	<b>77.2</b>	<b>1057</b>	<b>98.2</b>	<b>1182</b>	<b>109.8</b>
<b>FACILITY SUBTOTAL</b>		<b>3,081.0</b>	<b>286.2</b>	<b>4,086.0</b>	<b>379.6</b>	<b>5,062.0</b>	<b>470.3</b>	<b>6,992.0</b>	<b>649.6</b>
Storage: 20% of facility subtotal		616	57.2	817	75.9	1,012	94.1	1,398	129.9
Net-to-Gross: 25% of facility subtotal		770	71.6	1,022	94.9	1,266	117.6	1,748	162.4
Flight Kitchen		100	9.3	100	9.3	100	9.3	100	9.3
<b>FACILITY TOTAL</b>		<b>4,567</b>	<b>424.3</b>	<b>6,025</b>	<b>559.7</b>	<b>7,440</b>	<b>691.2</b>	<b>10,238</b>	<b>951.2</b>



**TABLE 72235-A (cont)  
SPACE CRITERIA FOR AUSTERE DINING FACILITIES**

		Facility Size Classifications							
		401-650		651-1000		1001-1500		1501-2200	
		Personnel Served		Personnel Served		Personnel Served		Personnel Served	
		288 Min. Seats		345 Min. Seats		460 Min. Seats		575 Min. Seats	
		2.3 Max Turnover		2.9 Max Turnover		3.3 Max Turnover		3.9 Max Turnover	
Functional Components		NSF	SM	NSF	SM	NSF	SM	NSF	SM
PUBLIC AREAS	Dining Area and Circulation	3760	349.3	5060	470.1	6055	562.5	8800	817.5
	Public Toilets	300	27.9	320	29.7	340	31.6	370	34.4
	Queue	750	69.7	1000	92.9	1100	102.2	1650	153.3
	Sign-in Station	80	7.4	100	9.3	120	11.1	120	11.1
Subtotal		<b>4890</b>	<b>454.3</b>	<b>6480</b>	<b>602.0</b>	<b>7615</b>	<b>707.5</b>	<b>10940</b>	<b>1016.4</b>
SERVING AREAS	Regular Food Line	600	55.7	650	60.4	1050	97.5	1300	120.8
	Fast Food Line	600	55.7	650	60.4	650	60.4	650	60.4
	Combination Food Line	0	0.0	0	0.0	0	0.0	0	0.0
	Beverage Line	650	60.4	700	65.0	810	75.3	1056	98.1
	Dish Washing	180	16.7	250	23.2	320	29.7	380	35.3
Subtotal		<b>2030</b>	<b>188.6</b>	<b>2250</b>	<b>209.0</b>	<b>2830</b>	<b>262.9</b>	<b>3386</b>	<b>314.6</b>
PREP AREAS	Kitchen	1040	96.6	1350	125.4	1555	144.5	2160	200.7
	Utensil Wash	330	30.7	400	37.2	500	46.5	600	55.7
Subtotal		<b>1370</b>	<b>127.3</b>	<b>1750</b>	<b>162.6</b>	<b>2055</b>	<b>190.9</b>	<b>2760</b>	<b>256.4</b>
SUPPORT AREAS	Office	318	29.5	318	29.5	318	29.5	318	29.5
	Staff Toilets	360	33.4	430	39.9	450	41.8	500	46.5
	Staff Lockers	260	24.2	380	35.3	380	35.3	480	44.6
	Janitor's Closet	50	4.6	75	7.0	75	7.0	100	9.3
	Can Wash	40	3.7	60	5.6	60	5.6	60	5.6
	Loading Dock	600	55.7	600	55.7	800	74.3	800	74.3
Subtotal		<b>1628</b>	<b>151.2</b>	<b>1863</b>	<b>173.1</b>	<b>2083</b>	<b>193.5</b>	<b>2258</b>	<b>209.8</b>
<b>FACILITY SUBTOTAL</b>		<b>9,918.0</b>	<b>921.4</b>	<b>12,343.0</b>	<b>1,146.7</b>	<b>14,583.0</b>	<b>1,354.8</b>	<b>19,344.0</b>	<b>1,797.1</b>
Storage: 20% of facility subtotal		1,984	184.3	2,469	229.3	2,917	271.0	3,869	359.4
Net-to-Gross: 25% of facility subtotal		2,480	230.4	3,086	286.7	3,646	338.7	4,836	449.3
Flight Kitchen		125	11.6	125	11.6	150	13.9	150	13.9
<b>FACILITY TOTAL</b>		<b>14,506</b>	<b>1,347.7</b>	<b>18,022</b>	<b>1,674.3</b>	<b>21,295</b>	<b>1,978.4</b>	<b>28,199</b>	<b>2,619.8</b>

Notes:

- (1) Not all locations will require a flight kitchen. A flight kitchen is a staging area where food products are assembled and packaged for delivery to aircraft. Remove the allowable area from the total requirement where flight kitchens are not needed
- (2) Dining area seating and circulation is based on 12 NSF per person.
- (3) Office area is based on accommodating office staff at 106 SF per person. Use of individual offices in lieu of a single office will be determined during the design phase.
- (4) For planning purposes, including recordation in iNFADS, loading docks must be counted at full size, or 100%. For cost purposes, loading docks can be counted at 50% of the allowable area.
- (5) For a breakdown of the staff lockers, refer to UFC 4-722-01 Dining Facilities, Appendix C, Section B-8.2. Lockers for staff personnel up to 150 PN should be integrated into the gross area of the building.

**72235-9 OVERSIZED FACILITIES.** Dining facilities that require more space than the maximum shown in Table 72235-A shall be sized as follows: Divide the projected increased demand/loading capacity by 2,200 (maximum personnel) shown in the table. This will yield a multiplier greater than “1”. Apply this multiplier to the allowances shown for the specific areas within the various functional components (Public, Serving, Prep, and Support Areas) for 2,200 personnel. Calculate the subtotals for the functional components and use the process provided for calculating storage adjustments and computing net-to-gross area as shown in Table 72235-A.

The following is provided as an example:

A new dining facility is required to accommodate 3,500 personnel (PN). Divide the 3,500 PN capacity requirement by the Table 72235-A maximum allowance of 2,200 PN; the result is a factor of 1.59. Using the maximum allowances for the functional components of the 2,200 PN facility, calculate as follows:

Public Areas:	13,140 NSF x 1.59 =	20,892.6 NSF
Serving Areas:	4,288 NSF x 1.59 =	6,817.9 NSF
Preparation Areas:	4,335 NSF x 1.59 =	6,892.7 NSF
Support Areas:	2,440 NSF x 1.59 =	3,879.6 NSF
Facility Subtotal:		= 38,482.8 NSF
Storage Req't (20% of Facility Subtotal):	=	7,696.6 GSF
<u>Net to Gross Allowance (25% of Fac. Sub.):</u>	=	<u>9,620.7 GSF</u>
Facility Total Requirement:		= 55,800.1 GSF

(Note: If a flight kitchen is required, it is added to the final facility GSF requirement; see Table 72235-A)

**72235-10 ACCESS AND PARKING.** Access and parking is not authorized for Privately Owned Vehicles (POVs). Fire truck access and fire lanes are authorized. Service vehicle access is authorized for pickups, deliveries, maintenance, etc as needed. Minimal parking for official vehicles, particularly alternative modes of transportation such as electric vehicles is authorized where applicable. Access drives for pickup and drop off areas for shuttle buses, etc. are authorized. Total parking areas for residents, visitors, staff, and service personnel should be extremely minimal and limited to mission support.

## 740 49      **AUSTERE INDOOR PHYSICAL FITNESS CENTER (GYM) (SF)**

For Austere Fitness Centers design criteria, refer to UFC 4-740-02 Appendix F located here: <https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-4-740-02>

This is the link to the Whole Building Design Guide (WBDG) Federal Facilities Criteria web page that hosts both the UFC 4-740-02 and the associated Fitness Space Program Spreadsheet (for non-Austere facilities). For Austere Dining Facilities, use space planning criteria located within this document.

The Department of the Navy Fitness Standards and Metrics which influence requirements for physical fitness facilities are available at this CNIC website: <http://www.navyfitness.org/fitness/>.

**74049-1      GENERAL.** Refer to the introduction to 740-series category codes (in the “700 Series - Housing and Community Facilities” section of this UFC) for general instructions regarding planning procedures and allowances for community facilities.

**74049-2      DEFINITION.** Austere physical fitness facilities provide facilities and support services to meet the individual physical fitness, coordination, skills development, recreational and training needs of military personnel stationed in designated austere operating environments. These facilities may also serve authorized civilians. Activities that are typically accommodated in these facilities include: athletic gear issue, calisthenics, cardiovascular training, physical fitness training, and weight-training.

**74049-3      RELATED FACILITIES.** Consideration should be given to collocation of the facility with other existing or planned recreational facilities in order to (1) take advantage of potential savings in space requirements and operating costs, and (2) provide users with the increased convenience of clustered facilities. These facilities would include:

- 740 53 Indoor Swimming Pool
- 750 10 Outdoor Playing Courts
- 750 20 Playing Fields
- 750 30 Outdoor Swimming Pool.

**74049-4      INSTALLATION POPULATION.** The primary functional components of an Indoor Fitness Facility - Basketball Court, Aerobics/Exercise Area, Cardiovascular Training Area, Weight Training Area, and Indoor Playing Court - are sized based on installation population. Installation population ranges are as follows:

- XSMALL = Population 0-500
- SMALL = Population 501-3,000
- MEDIUM = Population 3,001-7,000

LARGE = Population 7,001-14,000  
XLARGE = Population 14,001-30,000

**74049-4.1** Installation population is defined as Active Duty enlisted and officers, average on board transients, reservists and authorized civilians. Population numbers should be consistent with projected base loading data.

For facility planning purposes at installations with deployable forces, the active duty demand population is included all of the non-deployable population, plus two-thirds of the deployable population, to reflect time away on deployment. However, calculation of the deployable population may be adjusted based on the actual deployment experience at individual installations.

**74049-5 SPACE ALLOWANCES.** Space allowances for Austere Indoor Physical Fitness facilities are determined using Tables 74049-1 through 74049-5 on the following pages. The space allowance required for each component to meet the demand is obtained from the calculations of the installation population served by the facility. The total allowance for a facility is the sum total of the net space allowances for each functional component, adjusted using the net-to-gross factors reflected in the tables.

Notes for Space Allowance Tables 74049-1 through 74049-5:

- (1) Indoor Basketball Courts are discouraged in austere environments, and must be justified to, and authorized by, CNIC N944 prior to project scoping.
- (2) Fitness area includes warm-up/cool-down area, free weights, circuit/weight training machines, and cardiovascular equipment (bicycle, stepper, rower). Space for one Instructor Station should be included in each separate Weight Training Area.
- (3) Staff support spaces consist of:
  - (a) Control Counter and minimal administrative area.
  - (b) Gear Issue and Laundry Room for check-out of athletic gear and recreation equipment for leisure use.
  - (c) If gymnasium is authorized, include a Gymnasium Equipment Storage Room for equipment and supplies, such as roll-away baskets goals, volleyball standards, gymnasium floor coverings, roll-away bleachers, etc.
- (4) Space allowances in the tables are minimum allowances.

**Table 74049-1  
Space Allowance for Extra-Small Facility**

<b>AUSTERE INDOOR FITNESS CENTER</b>					
<b>Size = Base Population 1-500 = EXTRA SMALL</b>					
		<b>Qty</b>	<b>Allowance Per Qty (NSF)</b>	<b>NSF</b>	<b>SM</b>
		<b>Functional Components</b>			
<b>PUBLIC SPACES</b>	Entry Lobby (qty = module)	1	100	100	9.3
	Control Counter (qty = module)	1	125	125	11.6
	Equip Issue Storage (qty = module)	2	175	350	32.5
	<b>Subtotal</b>			<b>575</b>	<b>53.4</b>
<b>FITNESS SPACES</b>	Unit PT/Group Exercise Partionable Room(s) (qty = # of persons)	0	50	0	0.0
	Unit PT/Group Exercise Storage (10% of Unit PT/Group Exercise Room(s))		0.1	0	0.0
	Stretching Space	3	50	150	13.9
	Cardiovascular Equipment	20	50	1000	92.9
	Selectorized (machine) Weights	10	50	500	46.5
	Free/Plate Weights	15	65	975	90.6
	Fitness Assessment	1	125	125	11.6
	Gymnasium	**** See Notes ****			
<b>Subtotal</b>			<b>2750</b>	<b>255.5</b>	
<b>ADMIN SPACES</b>	Support Staff Workstations (qty = workstations)	0	64	0	0.0
	Copy/file/work/break Room (qty = workroom module)	1	80	80	7.4
	<b>Subtotal</b>			<b>80</b>	<b>7.4</b>
<b>LOCKER ROOMS</b>	Men's (60% of pop.) (qty = slots; see notes)	29	12	348	32.3
	Women's (40% of pop.) (qty = slots; see notes)	19	12	228	21.2
	<b>Subtotal</b>			<b>576</b>	<b>53.5</b>
<b>SUPPORT</b>	Laundry Room (1/2 machine combo laundry room)	1	180	180	16.7
	Laundry Storage Room	1	131	131	12.2
	Loading Dock	1	90	90	8.4
	<b>Subtotal</b>			<b>401</b>	<b>37.3</b>
<b>FACILITY SUBTOTAL</b>				<b>4,382.0</b>	<b>407.1</b>
<b>Net-to-Gross: 20% of facility subtotal</b>				876	81.4
<b>FACILITY TOTAL</b>				<b>5,258</b>	<b>488.5</b>
<b>Notes:</b>					
<p>1) Gymnasiums (basketball/volleyball courts) are optional and MUST be approved in writing by CNIC/N9. Approval letters must be attached to the Basic Facilities Requirement (BFR) document. Where approved, add: 8892 NSF (gym) + 700 NSF (storage) * 1.2 = 11,510 GSF/1069.4 SM.</p> <p>2) Locker distribution shown above is planned as a 60% male and 40% female split. This ratio can be changed based on mission needs but the final ratio needs to be represented on the appropriate BFR document(s).</p> <p>3) For locker distribution, provide two slots (spaces) for every three lockers (66%). This includes one full-sized and two half-sized lockers for every three required.</p> <p>4) Men's locker room includes space for 2 showers and 1 watercloset/lavatory modules.</p> <p>5) Women's locker room includes space for 1 showers and 1 watercloset/lavatory modules.</p> <p>6) The net to gross factor is based on a single story facility. In cases where the facility requires multiple floors, change the net to gross factor to 28%, or 1.28.</p>					

**Table 74049-2  
Space Allowance for Small Facility**

<b>AUSTERE INDOOR FITNESS CENTER</b>					
<b>Size = Base Population 501-3000 = SMALL</b>					
Functional Components		Qty	Allowance Per Qty (NSF)	NSF	SM
<b>PUBLIC SPACES</b>	Entry Lobby (qty = module)	2	100	200	18.6
	Control Counter (qty = module)	1	125	125	11.6
	Equip Issue Storage (qty = module)	2	175	350	32.5
	<b>Subtotal</b>			<b>675</b>	<b>62.7</b>
<b>FITNESS SPACES</b>	Unit PT/Group Exercise Partionable Room(s) (qty = # of persons)	25	50	1250	116.1
	Unit PT/Group Exercise Storage (10% of Unit PT/Group Exercise Room(s))		0.1	125	11.6
	Stretching Space	3	50	150	13.9
	Cardiovascular Equipment	35	50	1750	162.6
	Selectorized (machine) Weights	18	50	900	83.6
	Free/Plate Weights	15	65	975	90.6
	Fitness Assessment	1	125	125	11.6
	Gymnasium	**** See Notes ****			
<b>Subtotal</b>			<b>5275</b>	<b>490.1</b>	
<b>ADMIN SPACES</b>	Support Staff Workstations (qty = workstations)	1	64	64	5.9
	Copy/file/work/break Room (qty = workroom module)	1	80	80	7.4
	<b>Subtotal</b>			<b>144</b>	<b>13.4</b>
<b>LOCKER ROOMS</b>	Men's (60% of pop.) (qty = slots; see notes)	51	13	663	61.6
	Women's (40% of pop.) (qty = slots; see notes)	34	13	442	41.1
	<b>Subtotal</b>			<b>1105</b>	<b>102.7</b>
<b>SUPPORT</b>	Laundry Room (1/2 machine combo laundry room)	1	180	180	16.7
	Laundry Storage Room	1	189	189	17.6
	Loading Dock	1	90	90	8.4
	<b>Subtotal</b>			<b>459</b>	<b>42.6</b>
<b>FACILITY SUBTOTAL</b>				<b>7,658.0</b>	<b>711.5</b>
Net-to-Gross: 20% of facility subtotal				1,532	142.3
<b>FACILITY TOTAL</b>				<b>9,190</b>	<b>853.7</b>
Notes:					
1) Gymnasiums (basketball/volleyball courts) are optional and MUST be approved in writing by CNIC/N9. Approval letters must be attached to the Basic Facilities Requirement (BFR) document. Where approved, add: 8892 NSF (gym) + 700 NSF (storage) * 1.2 = 11,510 GSF/1069.4 SM.					
2) Locker distribution shown above is planned as a 60% male and 40% female split. This ratio can be changed based on mission needs but the final ratio needs to be represented on the appropriate BFR document(s).					
3) For locker distribution, provide two slots (spaces) for every three lockers (66%). This includes one full-sized and two half-sized lockers for every three required.					
4) Men's locker room includes space for 4 showers and 3 watercloset/lavatory modules.					
5) Women's locker room includes space for 2 showers and 3 watercloset/lavatory modules.					
6) The net to gross factor is based on a single story facility. In cases where the facility requires multiple floors, change the net to gross factor to 28%, or 1.28.					

**Table 74049-3  
Space Allowance for Medium Facility**

<b>AUSTERE INDOOR FITNESS CENTER</b>					
<b>Size = Base Population 3001-7000 = MEDIUM</b>					
Functional Components		Qty	Allowance Per Qty (NSF)	NSF	SM
<b>PUBLIC SPACES</b>	Entry Lobby (qty = module)	3	100	300	27.9
	Control Counter (qty = module)	2	125	250	23.2
	Equip Issue Storage (qty = module)	2	175	350	32.5
	<b>Subtotal</b>			<b>900</b>	<b>83.6</b>
<b>FITNESS SPACES</b>	Unit PT/Group Exercise Partionable Room(s) (qty = # of persons)	25	50	1250	116.1
	Unit PT/Group Exercise Storage (10% of Unit PT/Group Exercise Room(s))		0.1	125	11.6
	Stretching Space	6	50	300	27.9
	Cardiovascular Equipment	64	50	3200	297.3
	Selectorized (machine) Weights	18	50	900	83.6
	Free/Plate Weights	30	65	1950	181.2
	Fitness Assessment	1	125	125	11.6
	Gymnasium	**** See Notes ****			
<b>Subtotal</b>			<b>7850</b>	<b>729.3</b>	
<b>ADMIN SPACES</b>	Support Staff Workstations (qty = workstations)	2	64	128	11.9
	Copy/file/work/break Room (qty = workroom module)	2	80	160	14.9
	<b>Subtotal</b>			<b>288</b>	<b>26.8</b>
<b>LOCKER ROOMS</b>	Men's (60% of pop.) (qty = slots; see notes)	75	13	975	90.6
	Women's (40% of pop.) (qty = slots; see notes)	50	13	650	60.4
	<b>Subtotal</b>			<b>1625</b>	<b>151.0</b>
<b>SUPPORT</b>	Laundry Room (2/4 machine combo laundry room)	1	230	230	21.4
	Laundry Storage Room	1	318	318	29.5
	Loading Dock	1	90	90	8.4
	<b>Subtotal</b>			<b>638</b>	<b>59.3</b>
<b>FACILITY SUBTOTAL</b>				<b>11,301.0</b>	<b>1,049.9</b>
<b>Net-to-Gross: 20% of facility subtotal</b>				2,260	210.0
<b>FACILITY TOTAL</b>				<b>13,561</b>	<b>1,259.9</b>
Notes:					
1) Gymnasiums (basketball/volleyball courts) are optional and MUST be approved in writing by CNIC/N9. Approval letters must be attached to the Basic Facilities Requirement (BFR) document. Where approved, add: 8892 NSF (gym) + 700 NSF (storage) * 1.2 = 11,510 GSF/1069.4 SM.					
2) Locker distribution shown above is planned as a 60% male and 40% female split. This ratio can be changed based on mission needs but the final ratio needs to be represented on the appropriate BFR document(s).					
3) For locker distribution, provide two slots (spaces) for every three lockers (66%). This includes one full-sized and two half-sized lockers for every three required.					
4) Men's locker room includes space for 5 showers and 4 watercloset/lavatory modules.					
5) Women's locker room includes space for 3 showers and 4 watercloset/lavatory modules.					
6) The net to gross factor is based on a single story facility. In cases where the facility requires multiple floors, change the net to gross factor to 28%, or 1.28.					

**Table 74049-4  
Space Allowance for Large Facility**

<b>AUSTERE INDOOR FITNESS CENTER</b>					
<b>Size = Base Population 7,001-14,000 = LARGE</b>					
Functional Components		Qty	Allowance Per Qty (NSF)	NSF	SM
<b>PUBLIC SPACES</b>	Entry Lobby (qty = module)	4	100	400	37.2
	Control Counter (qty = module)	3	125	375	34.8
	Equip Issue Storage (qty = module)	3	175	525	48.8
	<b>Subtotal</b>			<b>1300</b>	<b>120.8</b>
<b>FITNESS SPACES</b>	Unit PT/Group Exercise Partionable Room(s) (qty = # of persons)	50	50	2500	232.3
	Unit PT/Group Exercise Storage (10% of Unit PT/Group Exercise Room(s))		0.1	250	23.2
	Stretching Space	8	50	400	37.2
	Cardiovascular Equipment	80	50	4000	371.6
	Selectorized (machine) Weights	36	50	1800	167.2
	Free/Plate Weights	30	65	1950	181.2
	Fitness Assessment	1	125	125	11.6
	Gymnasium	**** See Notes ****			
<b>Subtotal</b>			<b>11025</b>	<b>1024.3</b>	
<b>ADMIN SPACES</b>	Support Staff Workstations (qty = workstations)	3	64	192	17.8
	Copy/file/work/break Room (qty = workroom module)	2	80	160	14.9
	<b>Subtotal</b>			<b>352</b>	<b>32.7</b>
<b>LOCKER ROOMS</b>	Men's (60% of pop.) (qty = slots; see notes)	106	13	1378	128.0
	Women's (40% of pop.) (qty = slots; see notes)	70	13	910	84.5
	<b>Subtotal</b>			<b>2288</b>	<b>212.6</b>
<b>SUPPORT</b>	Laundry Room (3/6 machine combo laundry room)	1	315	315	29.3
	Laundry Storage Room	1	579	579	53.8
	Loading Dock	1	90	90	8.4
	<b>Subtotal</b>			<b>984</b>	<b>91.4</b>
<b>FACILITY SUBTOTAL</b>				<b>15,949.0</b>	<b>1,481.7</b>
Net-to-Gross: 20% of facility subtotal				3,190	296.3
<b>FACILITY TOTAL</b>				<b>19,139</b>	<b>1,778.1</b>
Notes:					
1) Gymnasiums (basketball/volleyball courts) are optional and MUST be approved in writing by CNIC/N9. Approval letters must be attached to the Basic Facilities Requirement (BFR) document. Where approved, add: 8892 NSF (gym) + 700 NSF (storage) * 1.2 = 11,510 GSF/1069.4 SM.					
2) Locker distribution shown above is planned as a 60% male and 40% female split. This ratio can be changed based on mission needs but the final ratio needs to be represented on the appropriate BFR document(s).					
3) For locker distribution, provide two slots (spaces) for every three lockers (66%). This includes one full-sized and two half-sized lockers for every three required.					
4) Men's locker room includes space for 7 showers and 5 watercloset/lavatory modules.					
5) Women's locker room includes space for 5 showers and 5 watercloset/lavatory modules.					
6) The net to gross factor is based on a single story facility. In cases where the facility requires multiple floors, change the net to gross factor to 28%, or 1.28.					



**Table 74049-5  
Space Allowance for Extra-Large Facility**

<b>AUSTERE INDOOR FITNESS CENTER</b>					
<b>Size = Base Population 14,001-30,000 = EXTRA LARGE</b>					
Functional Components		Qty	Allowance Per Qty (NSF)	NSF	SM
<b>PUBLIC SPACES</b>	Entry Lobby (qty = module)	5	100	500	46.5
	Control Counter (qty = module)	4	125	500	46.5
	Equip Issue Storage (qty = module)	3	175	525	48.8
	<b>Subtotal</b>			<b>1525</b>	<b>141.7</b>
<b>FITNESS SPACES</b>	Unit PT/Group Exercise Partitionable Room(s) (qty = # of persons)	50	50	2500	232.3
	Unit PT/Group Exercise Storage (10% of Unit PT/Group Exercise Room(s))		0.1	250	23.2
	Stretching Space	12	50	600	55.7
	Cardiovascular Equipment	125	50	6250	580.6
	Selectorized (machine) Weights	36	50	1800	167.2
	Free/Plate Weights	45	65	2925	271.7
	Fitness Assessment	1	125	125	11.6
	Gymnasium	**** See Notes ****			
<b>Subtotal</b>			<b>14450</b>	<b>1342.5</b>	
<b>ADMIN SPACES</b>	Support Staff Workstations (qty = workstations)	4	64	256	23.8
	Copy/file/work/break Room (qty = workroom module)	2	80	160	14.9
	<b>Subtotal</b>			<b>416</b>	<b>38.6</b>
<b>LOCKER ROOMS</b>	Men's (60% of pop.) (qty = slots; see notes)	136	13	1768	164.3
	Women's (40% of pop.) (qty = slots; see notes)	91	13	1183	109.9
	<b>Subtotal</b>			<b>2951</b>	<b>274.2</b>
<b>SUPPORT</b>	Laundry Room (4/8 machine combo laundry room)	1	385	385	35.8
	Laundry Storage Room	1	579	579	53.8
	Loading Dock	1	90	90	8.4
	<b>Subtotal</b>			<b>1054</b>	<b>97.9</b>
<b>FACILITY SUBTOTAL</b>				<b>20,396.0</b>	<b>1,894.9</b>
<b>Net-to-Gross: 20% of facility subtotal</b>				4,079	379.0
<b>FACILITY TOTAL</b>				<b>24,475</b>	<b>2,273.8</b>
Notes:					
1) Gymnasiums (basketball/volleyball courts) are optional and MUST be approved in writing by CNIC/N9. Approval letters must be attached to the Basic Facilities Requirement (BFR) document. Where approved, add: 8892 NSF (gym) + 700 NSF (storage) * 1.2 = <b>11,510 GSF/1069.4 SM</b> .					
2) Locker distribution shown above is planned as a 60% male and 40% female split. This ratio can be changed based on mission needs but the final ratio needs to be represented on the appropriate BFR document(s).					
3) For locker distribution, provide two slots (spaces) for every three lockers (66%). This includes one full-sized and two half-sized lockers for every three required.					
4) Men's locker room includes space for 9 showers and 7 watercloset/lavatory modules.					
5) Women's locker room includes space for 6 showers and 7 watercloset/lavatory modules.					
6) The net to gross factor is based on a single story facility. In cases where the facility requires multiple floors, change the net to gross factor to 28%, or 1.28.					

**74049-6 ACCESS AND PARKING.** Access and parking is not authorized for Privately Owned Vehicles (POVs). Fire truck access and fire lanes are authorized. Service vehicle access is authorized for pickups, deliveries, maintenance, etc as needed. Minimal parking for official vehicles, particularly alternative modes of transportation such as electric vehicles is authorized where applicable. Access drives for pickup and drop off areas for shuttle buses, etc. are authorized. Total parking areas for residents, visitors, staff, and service personnel should be extremely minimal and limited to mission support.