

Department of the Army
Pamphlet 420-10

Facilities Engineering

Space Management Guide

Headquarters
Department of the Army
Washington, DC
5 February 1987

UNCLASSIFIED

SUMMARY of CHANGE

DA PAM 420-10
Space Management Guide

This is a new pamphlet supporting the installation Directorate of Engineering and Housing (DEH) responsibility to manage space and its utilization. The guide describes space management concepts and procedures for installations. It contains staffing and organizational recommendations. It defines typical space management tasks and suggests how to accomplish them. The guide includes ideas for effective and efficient use of space. Examples are provided throughout the guide.

Facilities Engineering

Space Management Guide

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

History. This UPDATE printing publishes a new DA pamphlet which is effective 5 February 1987. This publication has been reorganized to make it compatible with the Army electronic

publishing database. No content has been changed.

Summary. This pamphlet provides guidance to Army installations in managing space by improving space planning, space evaluation, space assignment, and utilization. Procedures are explained for optimizing space usage in ways that promote worker productivity.

Applicability. This pamphlet applies to the Active Army, the Army National Guard, and the U.S. Army Reserve. It applies to all active Army installations, sub-installations, and assigned activities, to include tenant and contractor space.

Proponent and exception authority. Not applicable.

Interim changes. Interim changes to this pamphlet are not official unless they are authenticated by The Adjutant General. Users will destroy interim changes on

their expiration dates unless sooner superseded or rescinded.

Suggested Improvements. The proponent agency of this regulation is the Office of the Chief of Engineers. Users are invited to send comments and suggested improvements on DA form 2028 (Recommended Changes to Publications and Blank Forms) directly to HQDA (DA EN-ZCI-M), WASH DC 20310-2600.

Distribution. Distribution of this issue has been made in accordance with DA Form 12-9A-R requirements for 420-series publications. The number of copies distributed to a given subscriber is the number of copies requested in Block 357 of the subscriber's DA Form 12-9A-R. DA Pam 420-10 distribution is D for Active Army, D for ARNG, and D for USAR.

Contents (Listed by paragraph and page number)

Chapter 1

Introduction, page 1

Purpose • 1-1, page 1

References • 1-2, page 1

Explanation of abbreviations • 1-3, page 1

Background • 1-4, page 1

Chapter 2

Space Management Concepts, page 1

Facilities management • 2-1, page 1

Space management • 2-2, page 1

Space management objectives • 2-3, page 2

Why space management is important • 2-4, page 2

Mandated facilities management • 2-5, page 2

Policies and references on space management and usage • 2-6, page 2

Overview of space management tasks • 2-7, page 2

Roles and responsibilities • 2-8, page 3

Space quality • 2-9, page 3

Contents—Continued

Chapter 3

Staffing for Space Management, page 5

- Recommended organizational structure • 3-1, page 5
- Space Management Section • 3-2, page 5
- Space Management Board • 3-3, page 5
- Special task force • 3-4, page 6
- Contracted support • 3-5, page 6

Chapter 4

Space Management Procedures, page 6

- Overview • 4-1, page 6
- General principles • 4-2, page 6
- Assigning space • 4-3, page 7
- Shared spaces • 4-4, page 9
- Recordkeeping/validation • 4-5, page 9
- Support services • 4-6, page 10
- Planning and reporting • 4-7, page 11

Chapter 5

Special Problems in Space Management, page 11

- Introduction • 5-1, page 11
- Space standards • 5-2, page 11
- Improving space use • 5-3, page 11
- Improving space quality • 5-4, page 12
- Modifications to buildings • 5-5, page 12
- Alternative uses • 5-6, page 12
- Disposal and mothballing of buildings • 5-7, page 12
- Float space • 5-8, page 13
- Government-owned, contractor-operated (GOCO) installations • 5-9, page 13
- Leasing space • 5-10, page 13
- Maintaining adequate fire protection • 5-11, page 14

Chapter 6

Getting Started in Space Management, page 14

- Overview • 6-1, page 14
- Phase 1, Organizing • 6-2, page 14
- Phase 2, Filling gaps • 6-3, page 16
- Phase 3, Full operation • 6-4, page 17

Chapter 7

Space Management Board Activities, page 17

- Introduction • 7-1, page 17
- Space allocation • 7-2, page 17
- Review space management operations • 7-3, page 18
- Review space utilization • 7-4, page 18
- Initiate special actions • 7-5, page 18

Chapter 8

General Space-Saving Ideas, page 18

- Introduction • 8-1, page 18
- Administrative techniques • 8-2, page 18
- Facilities techniques • 8-3, page 19

Chapter 9

Administrative Offices, page 19

- Introduction • 9-1, page 19

Contents—Continued

General layout • 9–2, *page 20*
Workstation layout • 9–3, *page 20*
File systems • 9–4, *page 21*

Chapter 10

Storage Space and Warehouses, *page 22*

Introduction • 10–1, *page 22*
General considerations • 10–2, *page 22*
Reduce number of items stored • 10–3, *page 22*
Use stock management • 10–4, *page 22*
Reduce aisles • 10–5, *page 23*
Organize • 10–6, *page 23*
Optimize layout • 10–7, *page 23*
Use storage racks and shelving systems • 10–8, *page 23*
Fire suppression considerations • 10–9, *page 24*
Add a floor • 10–10, *page 24*
Use automated storage and retrieval systems • 10–11, *page 24*
Evaluate space usage • 10–12, *page 24*

Appendixes

A. References, *page 25*
B. Example Space Management Reports, *page 27*

Table List

Table 2–1: Participants and roles in installation space management, *page 4*
Table 10–1: Recommended aisle widths for two-way traffic, *page 23*

Figure List

Figure 2–1: Space management goals vary with the space available and space needed, *page 29*
Figure 2–2: The four functions of space management, *page 29*
Figure 3–1: Recommended organizational structure for space management, *page 30*
Figure 3–2: Recommended location for a space management office, *page 30*
Figure 3–3: Proposed guidance for establishing a Space Management Board, *page 31*
Figure 3–4: Possible structure for a space utilization task force, *page 32*
Figure 4–1: The space assignment process, *page 33*
Figure 4–2: Sample checklist of data for a space change request, *page 34*
Figure 4–3: Sample log of requests and actions, *page 34*
Figure 4–4: Typical tasks performed by the Space Management Office in processing a request, *page 35*
Figure 4–5: Sample checklist for evaluating space quality, *page 36*
Figure 4–5: Sample checklist for evaluating space quality—Continued, *page 37*
Figure 4–5: Sample checklist for evaluating space quality—Continued, *page 38*
Figure 4–5: Sample checklist for evaluating space quality—Continued, *page 39*
Figure 4–6: Sample summary of an evaluation, *page 40*
Figure 4–7: Sample worksheet for evaluating alternatives, *page 41*
Figure 4–8: Summary of space management records, *page 42*
Figure 5–1: Sample questionnaire for collecting user opinions about space quality, *page 43*
Figure 5–1: Sample questionnaire for collecting user opinions about space quality—Continued, *page 44*
Figure 5–2: Sample technical checklist for evaluating a space for alternative uses, *page 45*
Figure 5–3: Sample functional checklist for evaluating a space for alternative uses, *page 46*
Figure 9–1: Turning a desk toward a wall can save space, *page 47*
Figure 9–2: Conventional furniture workstations with movable partitions, *page 47*
Figure 9–3: Comparison of two layouts for regimented workstations, *page 47*
Figure 9–4: Workstation clusters with conventional furniture, *page 48*

Contents—Continued

- Figure 9-5: Workstation clusters with modular furniture, *page 48*
- Figure 9-6: Shared access for facing file cabinets helps save space, *page 49*
- Figure 9-7: Lateral files reduce access space, *page 49*
- Figure 9-8: Lateral files stacked two deep, *page 49*
- Figure 9-9: Example of lateral files that rotate, *page 50*
- Figure 9-10: Ferris wheel style lateral file unit, *page 50*
- Figure 9-11: Movable aisle file units, *page 51*
- Figure 10-1: Placement of shelves can improve space utilization, *page 51*
- Figure B-1: Example space utilization report by user, *page 52*
- Figure B-2: Example master schedule report, *page 53*
- Figure B-3: Space required versus space actually available, *page 54*
- Figure B-4: Office space quality, *page 54*
- Figure B-5: Example barracks space analysis, *page 55*
- Figure B-6: Space analysis for a given building, *page 55*
- Figure B-7: Example location utilization report for department ABC, *page 56*

Glossary

Chapter 1 Introduction

1-1. Purpose

a. This pamphlet assists Army installations in managing their space by improving space planning, space assignment, space evaluation, utilization, and performance of related space management activities.

b. This pamphlet provides methods and information applicable to nearly all kinds of spaces and facilities. Special emphasis is given to administrative office space, warehouse and storage space, meeting and community activity facilities, and school spaces. Users will find the procedures and data helpful for other kinds of space as well.

1-2. References

Required and related publications and referenced forms are listed in appendix A.

1-3. Explanation of abbreviations

Abbreviations used in this pamphlet are explained in the Glossary.

1-4. Background

a. Buildings and other facilities are considered resources. Like other resources, such as funds, people, equipment, and time, facilities must be managed to ensure that the right kinds and capacities are constructed, maintained, and retained on Army inventories. Thus, there is considerable interest in the Army to make the best possible use of buildings and other facilities. Good management is important in—

- (1) Minimizing unnecessary construction and maintenance costs.
- (2) Minimizing energy and other operating costs that may result from heating and cooling poorly used space.
- (3) Ensuring an equitable distribution of available resources to all units and activities at an installation.

b. Through good management, funding for facilities can be minimized and the money saved can be applied to other needs. Space management is part of the Army's overall effort to manage facilities effectively.

Chapter 2 Space Management Concepts

2-1. Facilities management

a. In recent times many corporations have changed the way they buy or lease, operate, maintain, and use facilities. They have recognized that large amounts of capital are invested in facilities, but that facilities by themselves do not produce anything. Knowing how difficult it is to keep facilities responsive to changes from within and outside their organizations, corporations are shifting from a caretaker to a management philosophy. They have realized that facilities must be managed much like other resources, and the responsibility for this management has moved upward in the corporate structure. Where in the past a plant engineer might have been in charge, now a vice president is. "Facilities management" and "facilities manager" are now common terms.

b. The Army, too, has recognized the importance of facilities management. More and more the Directorate of Engineering and Housing (DEH) and the installation commander are emphasizing the importance of managing facilities well. Good management is particularly needed to keep buildings and lands on Army installations supportive of changes in missions, weapons systems, organizational structure, units' activities, and many other operations. Facilities also must support the needs of soldiers and their families and contribute to the soldier's quality of life.

c. Facilities management is an orderly process of evaluating, maintaining, and adjusting the installation's existing facilities based on the many factors affecting Army organizations and what is needed to accomplish the missions and objectives. Facilities management is not limited to making sure enough facilities are provided; it must also ensure that facilities have the right characteristics and features, are available and usable when needed, and support organizational goals and user needs.

d. Although the Army already has orderly methods for installation and facilities planning, project design and construction, and operation and maintenance of buildings, grounds, utilities, and roads, these processes sometimes must be adjusted to meet new or changing requirements and to become more efficient and effective. Facilities users and occupants must coordinate in an organized way to achieve optimal utilization of existing facilities and accurate programming for construction of new facilities.

2-2. Space management

Space management is an important part of facilities management. It is a process of projecting space requirements, identifying deficiencies, allocating available space to users in an equitable way, monitoring use, assisting users with space usage problems, and resolving space problems. Like facilities management, space management not only is

concerned with the amounts of space, but must address the quality of space as well. Therefore, interaction with users and other organizational elements involved in facilities management is necessary.

2-3. Space management objectives

- a. Space management is needed to ensure that—
 - (1) New facilities are constructed only if needed.
 - (2) Unneeded facilities are closed and possibly disposed of to reduce maintenance costs.
 - (3) Occupancy is consolidated to minimize energy, maintenance, and other operating costs.
 - (4) Use and occupancy of space is validated and unauthorized use is ended.
 - (5) Available space is distributed equitably among all users.
 - (6) A safe and healthful workplace free of fire hazards is provided.
- b. Some installations may be short of space whereas others may have too much space for the specific mission. Therefore, the objectives (fig 2-1) to be applied at any given installation will be decided on a case-by-case basis, depending on the situation.

2-4. Why space management is important

Every Army organization must operate with limited resources, with misuse or ineffective use affecting the installation as a whole. Space management is one way of minimizing unneeded and wasted space so that funds can be reallocated to meet other critical needs.

2-5. Mandated facilities management

Federal administrators have recognized the need to manage facilities and space to avoid wasting money. Executive Order 12411, dated 29 March 1983, requires that all Federal agencies reduce their administrative space, used or held, to that amount which is essential for known agency missions (also see *Federal Register*, 50 F.R. 26517). Section 2 of the Executive Order delegates authority to the Administrator of the General Services Administration to establish objectives, procedures, and regulations to develop work space planning information and reporting systems required by the order. Headquarters, Department of the Army (HQDA, ATTN: DAEN-REH) will respond to these or similar high-level requirements for the entire Army.

2-6. Policies and references on space management and usage

- a. The Army has established specific policies for space management and usage in the areas of installation management, energy reduction, installation planning and closure, real property management, facilities engineering, and related subjects.
- b. In instances where there would appear to be duplications of support services among agencies, the principal consumer should be identified and arrangements made with other using services for the principal user to support the other using service, as prescribed in Defense Regional Interservice Support (DRIS) Regulation 4000.19-R, dated 28 March 1984.

2-7. Overview of space management tasks

- a. Space management is composed of the following four major functions: space assignments, support services, recordkeeping, and planning and reporting. (See fig 2-2.)
- b. Space assignment involves tasks such as receiving requests for space or changes in space, processing requests, and recommending a solution. Another key task of space assignment is making decisions about who gets what space. This function can be handled in several ways. However, without strong installation command authority and good information, space management will fail and attempts to circumvent decisions will be likely.
- c. In the support services function, users are assisted in making good use of space, organizing contents effectively, and ensuring that a space has desirable features and characteristics. Users do not always have the knowledge and experience to recognize layout deficiencies and maximize space usage, and therefore, help should be available.
- d. Recordkeeping includes the compilation, verification, and maintenance of many kinds of data. Data compiled include an inventory of spaces, and possibly personnel and furniture; standards for many kinds of spaces, both quantitative and qualitative; floor plans and tabular data on what space is assigned to whom; actual measurements of spaces and buildings; characteristics and features of particular spaces and facilities; and other data necessary to perform the space management functions. Recordkeeping includes periodic and special data collection to verify space assigned, usage, contents, and dimensions.
- e. In the space planning and reporting function, data provided by users are analyzed to project the kinds and amounts of space needed, information is compiled, and reports are prepared on space usage and related matters. Contact with other local organizations (such as service schools, community services office, range office, and medical services) is important when preparing space utilization reports because the organizations may schedule and manage

facilities and space. This function must work closely with installation master planning (AR 210–20) and range development (AR 210–21) boards in projecting what is needed.

2–8. Roles and responsibilities

A section of DEH performs most space management tasks. (See chap 3 for a recommended organizational structure.) However, many other organizations besides this section must be involved if space management goals are to be achieved. Each installation activity that is assigned space in installation facilities will identify one point of contact (POC) and one alternate to the DEH. This individual could also be the coordinator of the Facilities Engineering work requests for that activity. The activity is responsible for advising the DEH in advance of any change of the POC so that an orderly transfer of responsibility may be effected. Table 2–1 shows the personnel and roles most often involved; local variations are expected.

2–9. Space quality

Space quality can influence the effectiveness of ongoing activities and may affect space utilization as well. If conditions keep workers from performing the activities necessary to accomplish their missions, even though there is enough space, then the space features may have to be adjusted to improve the quality.

Table 2-1
Participants and roles in installation space management

Organization: Installation Commander (or designee)
Role: Serves as chairperson of the Space Management Board; responsible for all installation activity.

Directorate of Engineering and Housing

Organization: Space Management Section
Role: Installation staff specializing in performing space management functions and tasks.

Organization: Real Property Branch
Role: Cooperative DEH staff element which may share records and possibly assist in Space Management Section.

Organization: Design Branch
Role: Assists with space layouts, designing modifications due to space changes, and preparing related work orders.

Organization: Master Planning Branch
Role: Cooperative DEH staff with whom the Space Management Section maintains close coordination regarding planning.

Organization: Buildings and Grounds Division
Role: Cooperative DEH staff with whom the Space Management Section coordinates about quality aspects and modifications to spaces.

Organization: Utilities Division
Role: Cooperative DEH staff which coordinates with the Space Management Section regarding provision of utilities to spaces.

Organization: Fire Prevention and Protection Branch
Role: Cooperative DEH staff with whom the Space Management Section cooperates to assure adequate fire protection.

Organization: Environmental Branch
Role: Element that specializes in environmental assessment and protection.

Installation

Organization: Space Management Board
Role: Installation body that makes decisions about space allocation and provides direction to Space Management Section.

Director of Industrial Operations

Organization: Directorates Staff Element Supply
Role: Element with which the Space Management Section coordinates regarding furniture and equipment inventories and authorizations.

Directorate of Personnel and Training

Organization: Range Office
Role: Element managing training ranges and maneuver areas; provides utilization data to Space Management Section.

Organization: Range Development Board
Role: Body that plans range facility requirements, may coordinate planning function of Space Management Section.

Directorate of Personnel and Community Affairs

Organization: Community Affairs Office
Role: Manages the scheduling and use of facilities used by clubs and other community organizations, provides utilization data to the Space Management Section.

Organization: Safety Office
Role: Element that provides safety criteria and data to the Space Management Section.

Organization: Provost Marshal
Role: Element that provides physical security expertise and/or data to the Space Management Section.

Chapter 3 Staffing for Space Management

3-1. Recommended organizational structure

a. A space management system can be organized and staffed in several ways. Based on the experience at several Army installations, the structure shown in figure 3-1 is recommended. It has the following two key organizational elements: the Space Management Section and the Space Management Board. The Space Management Section is part of DEH and probably is best located within or colocated with the Real Property Branch. The Space Management Board is a specially created unit that meets on occasion and reports directly to the installation commander. Additional details about these two organizational elements are discussed in *b* and *c* below.

b. It should be recognized that organizational units other than the two above are involved in space management (table 2-1). They consist of those elements needing space or requesting adjustments in space; they can be called the "facilities users" or "space occupants." These are the elements at the installation for which the Space Management Section and Space Management Board really work.

c. In addition, there may be several organizational units that manage the scheduling and use of particular facilities and spaces. Examples are the range office that manages training ranges, a service school that manages training spaces such as classrooms, the Directorate of Personnel and Community Affairs (DPCA) that often manages club and related meeting spaces, the Directorate of Industrial Operations that manages and reports on storage and warehouse space, and the Directorate of Health Services that manages medical spaces. Each of these elements must report space management data to the Space Management Section as determined by local requirements.

3-2. Space Management Section

a. The Space Management Section completes the four space management functions on a day-to-day basis. As already suggested, this office probably is best structured within the Real Property Branch. (See fig 3-2.) The same person could head both elements. Close coordination with the Master Planning Office also is required, particularly for the planning and reporting function. Some space management tasks may have to be performed by other elements of DEH, depending on actual staffing and the incumbent's skills. For example, layouts (one of the Support Service tasks) may be prepared by the Design Branch or planning analysis may be performed by the Master Planning Branch.

b. The number of personnel required for space management will vary with installation size, amount of work to be completed, how centrally space management tasks are handled, and other factors. Some installations may require only a part-time position. However, for most installations, at least one full-time position will be required.

c. The space management personnel's skills are critical to the effectiveness of the four functions. The variety of skills needed are typically found with persons trained in architecture, industrial engineering, or space planning.

(1) Tasks associated with assigning space and recordkeeping require the least skill. However, the number of space changes and the volume of records can be sizable and may require a more capable individual to keep operations running smoothly. An experienced clerk may be able to perform most tasks in these functions. The records soon will be maintained on a computer.

(2) Some ability to deal with floor plans, analyze space layouts, and develop and use solutions is also needed. Preparing layouts requires knowledge of building systems and layout principles as well as training in technical drawings.

(3) Some knowledge of office automation may also be important, particularly if this office provides assistance in this area. Some experience is preferred since this function must operate much like a consulting service.

(4) The planning and reporting function will require some analytical skills to evaluate records and to project future space needs.

3-3. Space Management Board

a. The Space Management Board should have broad representation from all organizational elements of the installation. Tenant organizations at the installation also should be represented fairly. The number of members will depend on the installation's size. The Board should be chaired by the Deputy Installation Commander. Typical members are heads of directorates, commanders of major units, heads of tenant organizations, and those of similar rank and function. Spokesperson for the Space Management Section is normally the DEH, although the head of the Space Management Section will attend and be invited to speak on issues before the Board.

b. The Space Management Board meets as required. Generally, meeting more frequently than once per month is not necessary.

c. The Space Management Board's main responsibility is to make decisions about space assignments. Normally, this is done by approving recommendations of the Space Management Section that have been worked out with user groups who will be affected. In addition, the Space Management Board is responsible for other space management matters affecting the entire installation. Figure 3-3 gives proposed guidance for establishing a Space Management Board. Chapter 7 further describes Board activities.

d. At some installations, the Space Management Board has adopted a policy of not considering any matter if the

affected groups are not present at the meeting. The Space Management Section prepares the agenda, supporting materials, meeting notices, and related items needed for Board meetings.

3-4. Special task force

a. The staffing suggested in paragraphs 3-1 and 3-2 is for routine space management operations. In initiating space management activities, many space problems may have to be addressed. There may be a need to review current space use, make major space adjustments and reallocations, reduce space and building usage, or identify various inadequacies, deficiencies in space quantity, distribution, or quality. A special study may be needed.

b. One method for staffing a temporary, but important, space management activity is to appoint a special task force to deal with the problem. Task force members are assigned on special duty or extra duty to allow more personnel to concentrate on the tasks and shorten the time required to complete them. A space management or space usage task force can create ideas and possible actions quickly, making the task force an effective approach.

c. Task force members should be selected from the groups affected to provide broad-based representation. (See fig 3-4.) Ranks of members can vary, but a wide range of ranks, both military and civilian, should be considered. Persons with experience are more likely to understand their role. The goals, objectives, and tasks should be defined clearly. The task force should report its findings and recommendations to the Space Management Board for final consideration and action. Some items may need further evaluation by the Space Management Section or Board before they are implemented.

3-5. Contracted support

Another way to complete space management tasks quickly is by using contractors. One particular problem the Space Management Section must face is getting complete records on current space use. The DEH might seek contractor support to compile data for all spaces in the buildings and facilities on the installation. A contractor with expertise in this area may be hired to perform special space management studies, collect data, and perform other one-time, personnel-intensive work.

Chapter 4 Space Management Procedures

4-1. Overview

This section discusses methods and practices for the four space management functions and the tasks within them. The procedures included here were derived from visits to several space management organizations and a review of published data. They reflect recommendations from persons practicing space management and build on methods considered successful. However, there are many ways to manage space and local variations may be needed.

4-2. General principles

Some fundamentals for operating an effective space management program can be stated.

a. The staff of the Space Management Section must be customer-oriented. The Space Management Section can be effective only if customers are treated with the highest regard and user problems are assumed to be important. An atmosphere of cooperation and helpfulness is essential in dealing with users. Customers must feel that their needs are attended to promptly, objectively, and courteously.

b. User groups must feel they are treated fairly. Many factors can contribute to the user's perception that space is distributed in an equitable way, such as—

- (1) Having objective procedures for processing change.
- (2) Dealing with facts and accurate data.
- (3) Having broad representation on the Space Management Board and making open decisions.
- (4) Having space standards and applying them uniformly.

c. Space problems must be analyzed and solved in a rational decision-making approach. The problem must first be accurately identified and validated by both the user and the Space Management Section. Next, the root cause of the problem must be identified and all pertinent facts assembled. Finally, alternative solutions plus attendant impacts will be developed. The task of the Space Management Board is to choose the best alternative; not to bog itself down in the problem analysis. Recommendations for alternative selection will be made by affected parties to include the Space Management Section.

d. The Board must give consistent support to the Space Management Section staff. This principle is closely associated with *c* above. If the section staff is doing a good job, they make the Board's work easy. If the Board begins to second-guess or override the section staff's recommendations, the section staff's efforts will quickly deteriorate. The Board should not permit attempts to circumvent the section and standard procedures. Users should quickly learn that a political approach, rather than an objective one, is likely to produce a solution undesirable for them and the installation. The Board should ask questions about the section staff's recommendations to ensure that important factors were

considered and that the staff has not favored certain users. The Board should establish that the user's needs were balanced against those of the installation in general.

e. Board meetings should be open. To maintain an atmosphere of fair play and equal treatment in space distribution, it is important that the Board make decisions in a forum open to all organizational elements at the installation. Some installations feel that a Space Management Board should consider major agenda items only when affected elements are present.

f. Experience and training in dealing with space problems is very important. Experience in dealing with space problems is important in providing (1) effective solutions and (2) continuity. Someone who has developed solutions and has had opportunities to see how well they actually work after implementation is more qualified to solve space problems than the casual participant. The experienced person will also have a broader view, having seen the effects of certain solutions on building systems (for example, electrical and heating) and function (for example, circulation and user acceptance). Training in space management is important. The Space Management Section staff should be trained to provide the expertise needed for the installation.

g. Users should be encouraged to perform most tasks associated with a change in space. The Space Management Section's limited staff cannot do everything associated with a change in space; for example, preparing requests, submitting work orders, and preparing moving plans. Users should be encouraged to do as much of the paperwork as possible. Guidance and submittal format requirements may be obtained from the Space Management Section staff.

4-3. Assigning space

Users will submit most requests for space changes. Generally, these requests will seek *additional space* or *change in location*. The need to *reduce* the amount of space assigned to an organization is most likely to result from analyses by the Space Management Section or a study of what is assigned compared to what is actually needed and authorized. The need to *redistribute* space is most likely to result from a study of how space is actually distributed compared to functional relationships among occupants that should exist. These analyses will be discussed as part of the "planning and reporting" function.

a. *Space assignment process.* User requests for space changes must be handled in an orderly way. Figure 4-1 shows a space assignment process. Four participants are involved in the 12 steps that may occur. (Not all steps will apply to each case.)

(1) *Step 1.* Identify space problems. The space assigning process begins when a space problem is recognized, usually by users. Space problems develop gradually, but are seldom recognized until they become acute and quite obvious. Space problems often are assumed to result from a space shortage; however, they can include poor quality (such as not having the features users need), poor use of space provided, and poor arrangement of people and equipment. Therefore, although a space problem may be recognized, users may have difficulty defining exactly what is wrong or how severe it is. The problem should be analyzed to define it accurately and identify its scope. Solutions are not needed at this point.

(2) *Step 2.* Assist in space study. The user group may need assistance in defining a space problem or its scope. Because users often lack expertise and experience with space problems, they may seek help from the Space Management Section. This is one of the support services that the Space Management Section can offer. (See para 4-6.)

(3) *Step 3.* Apply administrative remedies. The first approach in solving many space problems is for the user group to take administrative action. This can include housecleaning; consolidating equipment, files, and records; transferring items to storage; disposing of unused equipment; and more careful scheduling of activities. Chapter 8 discusses some of these actions in more detail.

(4) *Step 4.* Collect justification data. If a space problem cannot be resolved through administrative remedies and a facility adjustment is required, this change must be justified. A request must have justification data, even when there are no direct costs. Although some justification data may have been compiled in steps 1 and 2, additional data may be needed. In step 5, a request will be submitted for a space change. The user must be able to show that current space is not adequate, that additional space or a different space is needed, and that any expenses to be paid by the installation are worthwhile and more important than other demands. The data needed will vary with the kind of change requested.

(5) *Step 5.* Submit a space change request. The user must formalize a space change request and submit it to the Space Management Section. A special request form can be used, although some installations find that a DA Form 2496 (Disposition Form (DF)) can better accommodate the variety of information associated with space change requests and supporting justification data. Figure 4-2 is a sample checklist of items that should be considered for a space change request.

(6) *Step 6.* Process a space change request.

(a) When the Space Management Section receives a request, the first action is to log it in and create a request file. Figure 4-3 is a sample log of requests and action items. The Space Management Board should be notified of all requests received and their status. Figure 4-4 shows steps that may be taken in processing a request.

(b) The Space Management Section staff will verify information associated with the request and will validate the justification data. For example, if the user group claims it has 37 permanent employees for whom it must provide

space, the section staff will check with the DPCA to ascertain the number of positions authorized for the user organization. Records other than personnel data will be checked with the appropriate organizations.

(c) The Space Management Section will also visit and evaluate the space currently occupied by the requesters to verify that the claimed deficiencies do, in fact, exist and to what extent. The Space Management Section records will be checked to see if currently occupied space corresponds to that assigned. If necessary, occupants may need to ensure that rooms will be measured, current layouts plotted, and furniture and equipment inventoried. The features can be tabulated and quality evaluated. Figure 4-5 is a sample checklist for assessing quality; figure 4-6 is a sample worksheet for summarizing the request evaluation.

(d) After claimed deficiencies and justification data are verified, the Space Management Section staff will identify alternative solutions. The users may have suggested one or more and others may be added.

(e) Next, the feasibility of each alternative will be checked and the attendant impact projected. This may include estimating cost, evaluating adjustments that others must make as the result of the change, and weighing the importance of time. Feasibility studies may require that general layouts be prepared or that a phased solution (a combination of interim and long-term) be considered. Figure 4-7 is a sample worksheet for comparing alternatives.

(f) Finally, the Space Management Section staff will make a recommendation to the user, stating what is seen as the best solution for the user and the installation. In some cases, the user may be given a choice. However, it may be better to offer one solution at a time, particularly if the solution has been prepared with some objectivity.

(g) All of these tasks may not be necessary for each space change request. However, good practice requires that a consistent series of tasks be used, even if the depth of each task varies between requests.

(h) The Space Management Section staff may work closely with the POC during this step. However, an unbiased assessment is essential to ensure the Section's credibility to those not directly involved or affected by a particular request.

(7) *Step 7. User accepts a solution.*

(a) In this step, the user accepts an alternative solution proposed by the Space Management Section. The user group may not accept the first proposal and some negotiation may be involved. The user group and the Space Management Section staff may have worked on solutions together and found one mutually acceptable, or the user group may have proposed one with its request that the Space Management Section found acceptable. The solution may involve more than one phase—a temporary solution initially and later, a permanent one that requires renovation or construction delays. Regardless of the approach, the important outcome is to find an acceptable solution.

(b) It is possible that no solution will be acceptable to the user. In this case, the Space Management Section and the user must present their respective views to the Space Management Board and accept any solution determined by the Board.

(c) The acceptance or rejection of a proposal and terms of the proposal should be documented. A DF can be used. The final concurrence or decision of the Board can be added to the DF after the next step.

(8) *Step 8. Prepare for space management board meeting.* The Space Management Section prepares each case for approval or decision by the Space Management Board at their next meeting. The office staff enters each case into the Board's meeting agenda. Documentation for each case (for example, request, justification, results of validation studies, evaluation of alternatives, cost estimates, and user acceptance) is prepared for the Board's consideration.

(9) *Step 9. Board approves solution.* The Space Management Board considers the Space Management Section's recommendation and gives the users an opportunity to present additional information. If the user group and the Space Management Section have not found a solution, the Board will hear each side and make a final decision. The Board may want to review cost estimates and scopes of work when building modifications are necessary to reallocate.

(10) *Step 10. Implement approved solution.*

(a) Normally implementation tasks are the users' responsibility. The Space Management Section will seldom be involved because of staff limitations. However, guidance and assistance should be provided to ensure that schedules and timeframes are maintained. Other DEH staff may become involved when necessary.

(b) The users are now ready to take action in response to Board approval. Work orders (DA Form 4283 (Facilities Engineering Work Request)) for requesting modifications to buildings and building systems are prepared and submitted to DEH. Work order submittal should include documentation verifying approval for the space change. Requisitions for furniture and equipment that comprise part of the solution are prepared and submitted to the appropriate installation activity. Requests for telephone and communication lines and equipment are completed and submitted to the local communications office. Detailed floor plans are drawn to define actual use of space. A moving plan is formulated by users and transportation units and others are notified of requirements and projected dates.

(c) Users should prepare an overall scheme and implementation schedule for a space change. The scheme and schedule should be submitted to the Space Management Section for review and approval. The Space Management Section will track the actions to ensure that they are completed when needed and to see that any difficulties are resolved. Implementation of major changes will be coordinated by the Space Management Section and require considerable planning, coordination, and communication.

(11) *Step 11. Complete implementation actions.* After Board approval, appropriate channels at the installation will respond to user requests and complete implementing actions. For example, Directorate of Industrial Operations (DIO)

will assist in procuring furnishings and equipment. DEH will make adjustments to the facility necessary for new occupants. The Installation Communication office will install telephone lines and instruments and other communication items as requested. The Transportation Office will help with the move.

(12) *Step 12.* Update records. After a solution is fully implemented, space management records must be updated. (See chap 6.) Several records may be involved depending on the nature and scope of the space change.

b. Dealing with space quality.

(1) In the process of assigning or reassigning space, space quality may need adjusting. Relocating power outlets; removing, adding, or relocating partitions; adding or closing in doors; and similar adjustments may be necessary. These changes in space features and characteristics must be noted and included in the request for change or any proposed solution. Such changes may be funded through DEH resources in competition with many other building modification, maintenance, and repair items not related to space assignment; or user groups may transfer funds to DEH from their own accounts. This is one reason good justification data are needed for space change requests. Adjustments in space quality are usually made first, before relocation is implemented. Chapter 5 gives some approaches for dealing with quality changes.

(2) Space quality adjustments may be needed that do not involve a relocation or change in the number of square feet. This need may result from changes in user activities, personnel, or equipment. The Space Management Section should not be involved in requests to adjust space quality unless the quality change results from a change in the amount of space or location required by a user.

4-4. Shared spaces

a. At most installations, many spaces are shared by several users. These spaces include conference rooms, classrooms, parade grounds, training ranges, maneuver areas, and athletic and recreational facilities. The use of most shared spaces is scheduled by organizations closely associated with them.

b. The Space Management Section must know which spaces are shared and what organizations handle the scheduling of their use. Data must be collected regularly from a POC in each of these organizations about the use of shared spaces. Actual use may require a sign-in/sign-out log so that differences between scheduled and actual use can be identified. Data may be required on how many people used a space and for how long. Actual use reports may be collected for a limited time (a week, 2 months) rather than continuously. The Space Management Section should define data requirements for each type of shared space and let organizations scheduling them know what the requirements are.

4-5. Recordkeeping/validation

An essential function in space management is recordkeeping and validation of spaces and their use. This function is needed to support the other space management functions.

a. Records.

(1) Several types of records are needed. Some are simply data files maintained in various forms. Others may include graphics, including floor plans, graphs, and charts. Records may be temporary, such as those obtained from other organizations on personnel and furniture and equipment, or they may be long-term and historical. Records may be maintained on paper in file cabinets, in computers, or in other forms and locations. The records will contain a variety of data types, some of which are shown in figure 4-8. Data also are collected from other organizations involved in space management, such as range office, service school, and medical organization.

(2) The Space Management Section in DEH could develop a master file of space management records for an installation. All space management records, or at least all usage records, for the installation would be kept in one location. Data should be managed carefully. Data requirements must be determined based on frequency of use and importance.

(3) Data are available for use by the Space Management Section at various locations on the installations. Installations now keep records of their buildings and facilities in the Assets Accounting Module of the Integrated Facilities System (IFS). The Assets Accounting Module contains the Real Property Inventory data. Data about the number and types of personnel assigned to organizations (important for office space management) can be obtained from the DPCA. Data about furniture and equipment on inventory are maintained by the DIO, although these data may not show where items are located.

(4) Some installations require user organizations to submit data to the Space Management Section on a periodic basis (for example, semiannually or annually) regarding use, content, and occupants in certain kinds of spaces. Records can then be updated with minimum manpower. The accuracy of data submitted by users may be limited and thus may require some verification. Appendix B shows some sample recordkeeping charts and tables generated manually or by using commercial microcomputer programs.

b. Validation.

(1) The use of space is continually modified as contents, activities, and occupants change. An organization assigned to a space may have different needs a year or 2 later. In addition, data submitted by an organization in a space change request may not be fully accurate. Therefore, when changes in space allocation are considered, when special studies are conducted, or when use is documented, it may be necessary to validate information about certain spaces. Records may

become outdated quickly, making it important to visit buildings often. When changes exist, the Space Management Section should notify the Real Property Office so that appropriate revisions can be made to the Real Property Inventory.

(2) When necessary, the Space Management Section must establish a space's present status. Validation can require measurements, counting occupants, and comparing actual users to those authorized. An evaluation of space quality also may be needed to see if it is suitable for current or alternative use or to find out if modifications are necessary and feasible. An inventory of furniture and equipment in a space may be needed. If space is not being used effectively, recommendations for improving utilization should be made to the user and documented.

4-6. Support services

Users often lack knowledge and experience in space management and may need assistance in identifying space problems and using space efficiently. They may need help with layouts, evaluating current space, and procedures for space changes. They will look to the Space Management Section at their installation for expertise and experience.

a. Layouts.

(1) Users often think they need more space when the real problem is poor use of what they have. They may need help in organizing equipment, furniture, traffic flow, and activities. Many space problems can be resolved through layout techniques. The Space Management Section or the Design Branch in DEH can help with layouts.

(2) Layout techniques involve translating user requirements into a floor plan or design. These plans are then converted to actual organization of activities and equipment in a space. Two distinct kinds of layouts are possible, each with a different purpose. One kind involves determining a general fit for users of a space. The other method involves making a detailed layout to find an exact fit on paper before equipment is installed.

(3) General layouts are often used for feasibility studies in which it is desired to know if a space can be used for a particular organization or purpose. It may also be important to know if a physical arrangement will work and meet user requirements. Circulation routes and aisles must be checked to ensure they meet fire codes and safety standards. One or more general layouts are prepared and compared to user requirements. The layouts may also be compared with each other to see which requires the least amount of space.

(4) Detailed layouts are prepared when a general fit has been found suitable and a user is ready to move in. This layout will be used to determine where each piece of furniture or equipment will be placed and what modifications to the facility are needed. Will doors have to be blocked or new ones cut? Will electrical outlets and telephone or computer receptacles need to be relocated or added? Will partitions need to be removed, modified, or added? Will water, sewer, or other piping systems need to be relocated? Will safety standards be met? Are any adjustments required for accessibility for the handicapped? Will fire protection systems be adequate or must they be modified? Will the heating, ventilating, and air-conditioning (HVAC) and lighting systems require modification? Answers to these and other questions will be converted into work orders (DA Form 4283) and submitted to the DEH. Movers will also use the detailed layout to deliver and place furniture and equipment.

b. Evaluation.

(1) As figure 4-1 shows, the users will usually identify space problems. When trying to find out how severe a problem is or when looking for administrative remedies, users will seek assistance from the Space Management Section. Well trained, experienced Space Management Section staff can help with methods for making a systematic, orderly evaluation of user spaces. They may also have analytical techniques to help pinpoint a problem or its severity. For example, a user organization may think its problem is severe; but relative to standards or other organizations on the installation, the problem may not be very bad.

(2) Being able to assist users in defining space problems and finding temporary or administrative solutions is a valuable function of the Space Management Section. It can also be an effective way to meet other goals, such as avoiding construction, maintaining good utilization, and minimizing expenditures.

c. Implementation.

(1) After the Space Management Board has approved a space change, several more actions may need to be taken before the change is finished. Work requests must be submitted for removing, relocating, or adding partitions, changing power and utility systems, and providing telephone, computer, or educational television lines. This work may be necessary; however, limitations of new work funds may preclude all but essential work being accomplished. One organization may complete the actions or several may be involved. If conversion or diversion of a facility is involved, a request for approval of the conversion or diversion of the facility may need to be submitted by the Real Property Office for the appropriate approval. Knowing how to proceed may be beyond the user organization's knowledge and experience; this is particularly true when several user groups are involved in a space change and implementing actions are complex.

(2) After changes to a space are completed, the user is ready to move in. Arrangements must be made in advance for transportation and assistance with the move. When several user groups are involved, the sequencing of the move may become difficult. Again, experience and planning can be vital. The Space Management Section will advise when space is available and coordinate all moving schedules.

4-7. Planning and reporting

Another important function of the Space Management Section is analyzing data in space management records; assisting the Installation Master Planner, Master Planning Board, and others in defining the kinds and amounts of space needed; and preparing utilization and other reports for the installation, major Army command (MACOM) headquarters, and DA. Conducting or participating in special studies about space utilization and space management is also involved in this function.

a. Planning space needs. Space management records will contain the kinds and amounts of spaces available on the installation. They may also contain some information about what else is needed. The Space Management Section staff's knowledge about space on the installation and how it is used is helpful in planning.

b. Analyzing space management data.

(1) The most important kind of analysis performed by the Space Management Section is computing space utilization factors. Different kinds of spaces are measured for utilization rates by different parameters. Classroom utilization, for example, is measured in terms of percent of hours of use relative to a maximum possible use time. Classrooms might also be measured in terms of percent occupancy relative to maximum capacity, or in terms of students or classes per day. Offices are measured by square feet per person. Storage space is measured by cubic feet in use. Retail stores are measured in terms of dollar sales per square foot. Several analytical methods are used to provide these rates.

(2) Another form of analysis involves looking at trends to explain changes in space demands, space utilization, space occupied, or vacant space over a period of time. Trend data can be very useful for planning and making decisions,

c. Reports. The results of analyses are communicated and documented in reports. Some reports must be submitted annually to higher organizations. Local reports may be prepared weekly, monthly, quarterly, or annually, depending on local operating procedures. (See paras B-2 through B-9 for examples of reports.)

d. Special studies.

(1) The Space Management Section occasionally will conduct special studies to determine space utilization, validate current space use, and for other purposes. The studies may be done in coordination with and in support of major user organizations on the installation. For example, medical services may be asking for additional space. Before the space request can be processed, it must be established that the best use of current medical facilities is being made. The Space Management Section must survey current facilities with the medical services staff to chart specific activities and uses. Data from the medical services may be compared with Space Management Section records. Results will show whether the request is valid.

(2) The Space Management Section may also work with special task groups addressing space utilization related matters. The Space Management Section may assist in setting up special studies by contractors and may serve as a POC for contractors working on space utilization and management studies.

Chapter 5 Special Problems in Space Management

5-1. Introduction

Persons involved with space management face several special activities and have to deal with special subjects. Some of these problem areas are identified so that the space manager will anticipate them.

5-2. Space standards

a. A corollary to Parkinson's Law states that "an organization will fill the amount of space available." That is, organizations will continue to ask for more and more space and find a way to use it if they are allowed to have it. A common way to control the amount of space an organization may have is to utilize existing space factors. Standards are specified in several ways, such as square feet per person, square feet per organizational unit, and square feet per unit item.

b. Space allowance standards for the Army are found in DOD 4270.1-M and some Army documents. These space allowance criteria have been compiled into one listing in the Army Criteria Tracking System (ACTS), an element of the Programming, Administration, and Execution System (PAX). Space standards in ACTS are organized by Army building category codes. (See AR 415-28.) ACTS is available to all Army organizations. To access ACTS, contact U.S. Army Corps of Engineers, ATTN: DAEN-ZCI, Washington, D.C. 20310-2600.

5-3. Improving space use

A major goal of space management is to keep space utilization at a high level, that is, to ensure that users make good use of the space available. This is important for the entire building stock of an installation as well as each organization assigned space. Several methods can be used to achieve efficient utilization; some of these can be termed "administrative techniques," while others are called "facility techniques." Chapter 8 discusses these two approaches further.

5-4. Improving space quality

a. A space's functional characteristics may affect the performance, safety, and satisfaction of those who occupy and use it. Space quality often has an indirect effect on the cost of operations and productivity. For example, poor lighting may increase reading time and error rates. Or, if a user does not have an electrical outlet where it is needed, an extension cord will be used that may create an electrical and tripping hazard. Employee turnover or job dissatisfaction may increase when workers have to adjust to workplace inadequacies.

b. Some workers perceive quality in a building as having everything in good repair. No one wants to work in a building where the door is falling off, the water faucet doesn't work, the floor is severely worn, or the roof leaks. The Integrated Facilities System used in DEH contains data on deficiencies like these. Inspectors look at buildings on a regular basis to rate conditions and to decide if major components need repair or replacement.

c. The most important aspect of quality for a user is whether features are present so that work can be performed effectively and efficiently. Users also may need special features to ensure safety of their activities and equipment. These functional aspects of quality can affect space utilization.

d. One approach for determining if space quality is adequate is to inspect the spaces and compare them with established minimum standards of quality. The difficult part is finding minimum standards of quality. For many kinds of space, they are not readily available and must be established locally.

e. Army literature contains some standards for space quality. (See TM 5-803-4, TM 5-803-12, Design Guide (DG) 1110-3-104, and DG 1110-3-106.) Chapters 8 through 10 also contain some data for a few space types.

f. When inspecting spaces for quality, a checklist like the one in figure 4-5 can be used.

g. A second approach is to ask occupants and users of a space what they think about the quality. A questionnaire like the one in figure 5-1 can be used to collect the data. The disadvantage of this approach is that several steps are required to prepare and distribute the questionnaires, tabulate the responses, and compile the results. In addition, there is no standard that tells what score means a space is acceptable. The advantages are that more eyes and ears are used and the results reflect judgments by those to whom the space's conditions are important. Care must be taken when using the questionnaire approach to collect information only about matters that can be corrected when a deficiency is identified. Extraneous and other useless information should be omitted.

5-5. Modifications to buildings

a. Some adjustments to the space are often needed when space is reallocated. These modifications should be minimized to keep costs down.

b. One way to minimize modifications is to consider those necessary for alternative solutions when space assignments are being made. Modifications needed for each alternative must be identified and costs for the changes projected.

c. Another way to minimize modification is to spend extra time laying out a solution. Working around physical constraints when formulating a layout is not an easy task in reducing modification costs; in addition, care must be taken in the layout so that space utilization is not compromised as a result of cutbacks in modifications. The number of modifications might be reduced, but it is unlikely that all modifications can be avoided and still maintain good space utilization.

d. Building modifications normally are implemented by the DEH staff in response to work orders (DA Form 4283). For telephone and other communication lines, the local communications office will complete modifications.

5-6. Alternative uses

a. An Army installation constantly undergoes change, so that its space needs and elements change as well. Thus, old building systems (such as electrical equipment) often must be upgraded to meet new user requirements. Office automation equipment is a good example of growing demands on a building electrical system. A problem space managers continually face is reusing old space for new occupants and keeping spaces supportive of new demands from users. Some key questions are as follows:

(1) What alternative uses can a space accommodate?

(2) What demands for features can a space support?

b. When the basic use of a building is changed, the building's capabilities must be considered carefully. In addition to judging if a new activity can be located in a building originally designed for some other function, the building's major subsystems must be analyzed. An example of an alternative use that failed is a warehouse in Florida that was converted to an office with a parking area on the roof. Soon after the new office opened, the roof collapsed, killing several people. In adapting the warehouse to a new use, the building's structural capabilities had not been evaluated.

c. Figure 5-2 is a checklist of technical items that should be considered before implementing an alternative use. Specialists within DEH can assist with this evaluation. Figure 5-3 is a checklist of functional considerations that may be important when an alternative use is considered.

5-7. Disposal and mothballing of buildings

a. One goal for space management is to reduce building maintenance costs. If a building is no longer needed, the maintenance cost can be eliminated by disposing of the building. The decision on disposal must follow AR 405-90; the

Space Management Section does not make this decision. However, when a building is unoccupied, the Real Property Branch, Master Planning Branch, and perhaps others with a role in disposal decisions must be notified. A listing of unoccupied spaces and buildings will be maintained in a current status by the Space Management Office. The Building Information Schedule, if complete, may be used as a tool to obtain inactive/vacant building data.

b. Another way to minimize maintenance costs for unoccupied buildings is to “mothball” them. This means some treatment or action is taken to minimize corrosion; prevent deterioration due to moisture, rodents, or sunlight; prevent vandalism; reduce preventive maintenance; or take other actions that will avoid operations and maintenance (O&M) costs and make the building usable at a later date. Actions that are needed to “mothball” a building are contained in AR 210-17.

5-8. Float space

a. If all usable space is occupied and a space change is needed, nothing can be done to respond to it. No one can move without being shut down for a period of time while someone else is moved. Someone has to move first, but that person must have a place to go. Therefore, in managing space, a small amount of excess space (float space) is needed so that adjustments can be made. An installation is not authorized float space, but in reality, some must exist.

b. Float space can be obtained in ways that minimize the amount available. For example, a building scheduled for demolition may provide a temporary location for a user during space realignment. Another way to create float space is to reactivate a mothballed building for awhile. Float space can also be created by crowding activities together while changes are made or by using space normally occupied by another group, such as when a combat unit is located elsewhere for special maneuvers. Float space also can be leased at a building near the installation for a short time to allow space changes.

5-9. Government-owned, contractor-operated (GOCO) installations

a. Some Army installations, particularly those with a production mission, are owned by the Government but operated by a contractor. The Army typically keeps a very small skeleton organization at these installations. This kind of installation creates some operational problems for space management, especially when much of the building is not in use. Special provisions in the contract may be needed to ensure that the contractor manages space effectively. The Army skeleton staff must assign one of its people to oversee space management.

b. Some GOCO contractors are paid based on the activity level at the installation. Therefore, the more workers and activities in the place, the more the contractor is paid. Under this arrangement, the contractor benefits from reducing the number of active buildings, consolidating activities, and doing a good job of space management. One solution might be to add incentive clauses in the contract. For example, the contractor could be allowed to share in energy savings due to consolidation and building closure. Or, a clause could be added to give the contractor a bonus for minimizing unused buildings, maximizing space utilization rates, or keeping utilization rates at or above some level based on a standard activity level or on the installation’s population.

c. The contract should specify what reports are required, their frequency, and their content. The contractor should develop and maintain a file of spaces available at the installation by type. The size of each space should be included. The file should contain data on whether a space is in use and, if so, to whom it is assigned. These and other data to be included in the file, the frequency of file updates, and other specifications can be part of the contract.

d. The local Army staff must verify that the contractor is fulfilling space management and space utilization agreements. At least a random sample of spaces must be checked yearly to ensure that the contractor’s reports are accurate. A walkthrough can be done to establish that—

- (1) Use is authorized.
- (2) A space is actually in use.
- (3) Use is as reported.

5-10. Leasing space

Real property is leased for the DA by either General Services Administration (GSA) or the Corps of Engineers. In general, GSA leases general-purpose space in urban centers whereas the Corps of Engineers leases special-purpose space, wherever located, as well as general-purpose space outside urban centers. General-purpose space is defined as “space in buildings, including land incidental thereto, suitable for the general use of Government agencies, including but not limited to office space, general storage space, inside parking space, and warehouse space.” Special-purpose space is defined as “space in buildings, including land incidental thereto, wholly or predominantly used for the special purposes of an agency and not generally suitable for general-purpose use, including but not limited to hospitals, housing, and laboratories.”

a. GSA is responsible within selected urban centers for—

- (1) Acquisition by lease of general-purpose space.
- (2) Assignment and reassignment of such leased space.
- (3) Operation, maintenance, and custody of those properties.

b. The Corps of Engineers has authority to lease real property as follows:

- (1) General-purpose space not reserved by GSA.
- (2) Special-purpose space regardless of geographical location.
- (3) General-purpose space required for use incidental to and near special-purpose space.
- (4) General-purpose space and special-purpose space regardless of geographical location when the rent is nominal.
- (5) General- and special-purpose space in territories and possessions other than Puerto Rico and the Virgin Islands.

5-11. Maintaining adequate fire protection

Changes in the occupancy of a space may create new fire requirements. For example, changing a warehouse into an office may require additional exits and a fire alarm system. Sprinkler protection may be required if some other occupancy is converted into storage, and the addition of computers creates many new requirements for fire detection and suppression systems.

Chapter 6 Getting Started in Space Management

6-1. Overview

Several steps are necessary to begin a space management program. Implementation of space management is not complete immediately when the function is taken over by organization or someone is assigned responsibility for it. The process of getting started can be divided into three phases:

- a. Organizing.
- b. Filling gaps.
- c. Full operation.

6-2. Phase 1, Organizing

a. *General.* The major activities in phase 1 deal with creating policy and procedures, staffing, establishing cooperation and communication between the Space Management Section and other key organizations, and setting up recordkeeping and reporting. Specifically, these include—

- (1) Establishing a space management policy.
- (2) Creating a Space Management Board.
- (3) Creating and staffing the Space Management Office.
- (4) Training the space management staff.
- (5) Creating standard operating procedures.
- (6) Initiating coordination with major space users, other DEH staff, and other organizations.
- (7) Setting up recordkeeping.
- (8) Establishing routine local reports.
- (9) Processing space change requests.

b. *Establish space management policy.* The first step that should be taken is to create a policy statement (in the form of a local regulation) that states how space will be managed, who will be involved, what each participant's responsibility is, and how costs associated with space management activities will be handled. Typically, this policy statement will create the Space Management Board, define its membership, and assign space assignment decision-making to the Board or define an alternative arrangement. The policy will assign space management to DEH. For most installations, this task has already been done.

c. *Create a Space Management Board.* If the installation will have a Space Management Board, the members must be identified. The Board must then meet to organize and to clarify its duties. The Board must adopt times and procedures for its meetings, establish means for communication among members, and address how it will perform its functions in general. The Board needs to work with the head of the Space Management Section and the DEH (assumed to be a member of the Board) to determine what major space management activities are most important and to initiate actions to get them done.

d. *Create and staff the Space Management Section.*

- (1) DEH must—
 - (a) Determine where the Space Management Section will be located in the DEH organization. (See chap 3 for suggestions for organizational structure and staffing.)
 - (b) Create office space,
 - (c) Secure staff.
- (2) A job description must be prepared for each position. An effort to gain and establish suitable positions must be made. The staff can be temporary or permanent, military, or civilian. An interim staffing solution may be necessary to get started while permanent arrangements are negotiated.

(3) In selecting and planning the office space, it must be realized that users will often be looking for it to bring in space change requests or to discuss progress toward solutions. The office should be accessible and easily identified. If layouts are to be done in the Space Management Section, a drafting table will be needed with proper lighting and storage for drawings. The table also can provide a place to open drawings for review and discussion.

e. Train space management staff. Staff in the Space Management Section must be trained or at least given a chance to learn what tasks must be done and what information and knowledge they must have or acquire on the job. Opportunity must be provided to become familiar with applicable Army regulations and policy, local policy and procedures, Army and Department of Defense (DOD) space standards, use of computer systems on which space management records are maintained, and use of other job-related resources that may be in place already. Training courses are listed below.

(1) Introduction to Federal Space Management. (This course is available through the GSA Training Center, WASH DC 20406.)

(2) Space Management Office Layout Workshop. (Available through the Graduate School, U.S. Department of Agriculture, 600 Maryland Ave. S.W., Room 106, WASH DC 20024.)

(3) The Executive's Guide to Office Space Planning.

(4) How to Plan and Manage Warehouse Operations.

(5) Office Space Planning and Design Office Space Management. (Courses (3) through (5) are available through the American Management Association, Extension Institute, 135 West 50th street, New York, NY 10020.)

(6) Installation Real Property Management. (Available through DEH, Huntsville Division, U.S. Army Corps of Engineers, PO Box 1600, Huntsville, AL 35807.)

f. Create standard operating procedures. If space management operating procedures do not already exist, the Space Management Section must develop them. Current ones may need to be expanded or modified to make them more efficient and effective. If not already formulated, these could include recommended procedures for Space Management Board meetings. Formulation of standard operating procedures should address topics such as special office procedures for the Space Management Section, recordkeeping standards, processing of requests for change, and related procedures that affect users, conduct of special studies, routine and special reports, annual and monthly activity calendars of space management events, forms and worksheets for processing information, tracking actions, and keeping track of time spent on space management activities.

g. Initiate coordination with major space users. Most installations will have major space users who are assigned large amounts of space and manage the distribution and use of that space on their own. These organizations may include the Directorate of Health Services, the Directorate of Personnel and Community Affairs, the Army and Air Force Exchange Service, the Range Office, and service schools. The Space Management Section must establish a POC within each of these or identify the space manager within each so that space and utilization data can be obtained regularly. Communication, cooperation, and coordination should be fostered. Space management policy and procedures occasionally must be discussed with these major users; a regular meeting with these POCs could be held for these purposes.

h. Initiate interaction with other DEH staff. The Space Management Section staff must establish working relationships with other DEH elements and operating procedures must be worked out. Some of the important DEH relationships are those with the Master Planning Office, Engineer Resource Management Division, Design Branch, and Real Property Branch.

i. Initiate coordination with other installation staff organizations. As noted earlier, key data for space management must be obtained from DPCA, DIO, and perhaps others. POCs must be identified and procedures for requesting information should be understood or established.

j. Set up recordkeeping system for spaces. An important function of the Space Management Section is keeping track of information and tracking changes. A system in which these data can be stored should be formulated. In this phase, a special effort to compile all records is not made. Information for records will be collected and records established only as data become available through normal processing of space change requests. The IFS can be used to handle much of these data (*IFS Users' Manual*). (See figs B-1 through B-7 for examples.)

k. Establish routine local reports.

(1) The overall goal of space management is to improve space utilization. This means that a measure of space will be assigned based on space required or authorized. For some spaces and facilities, utilization is measured in terms of frequency of use compared to maximum possible use time, or in terms of number of users compared to the maximum capacity of the space or facility.

(2) Another measure of space management effectiveness is the amount of space that has been closed or eliminated when there is an excess. The objective is to reduce energy, maintenance, and repair costs; space reductions translate directly into energy savings and, thus, dollars saved.

(3) The Space Management Section may promote improvements in space use that will not show up in the reports. For example, if the Space Management Section can help a group make better use of the space already assigned, thus preventing a request for additional space, utilization records will not reflect these actions. Moreover, the Space Management Section may help a user improve the space's quality, coordinate changes in telephone and communication

systems, or coordinate a move; these actions also will not be found in a utilization report. A report should be created to show assistance given and results achieved when this information is not recorded in utilization reports.

(4) Data and utilization reports may need to be collected from major users. For example, the Range Office in the Directorate of Plans and Training prepares utilization reports on training completed and the throughput rate for range facilities. Copies should be forwarded to the Space Management Section. DPCA, which schedules space use for clubs and community meetings, also should prepare a utilization report and forward a copy to the Space Management Section.

(5) In starting a space management program, the Space Management Section must establish what reports are needed, who needs to receive them, how frequently they should be prepared, and what data they should contain. Reports that are or should be prepared by major users need to be identified. Figures B-1 through B-7 give examples of reports.

l. Process space change requests. During phase 1, the process of handling space change requests submitted by users is initiated. Space change requests that may result from special studies or task groups typically are not emphasized during this phase. These special efforts, studies, and plans for major adjustments in space and relocations typically are initiated in later phases. The Space Management Section will schedule meetings for the Space Management Board, send announcements to Board members, and prepare the agenda and materials for Board consideration.

6-3. Phase 2, Filling gaps

a. General. In phase 2, the policy, procedures, and activities of phase 1 are adjusted to fill in gaps where foresight was not adequate, smooth out operations, and improve information accuracy and communication. In addition, a major effort is made to collect data on spaces and compile records. Reporting procedures that could not be implemented without these records are initiated. The specific activities are—

- (1) Compiling data for recordkeeping.
- (2) Completing staffing of The Space Management Office.
- (3) Completing implementation of operations.
- (4) Initiating a routine analysis process.
- (5) Initiating special studies and/or a task force.

b. Compile data for recordkeeping.

(1) Bringing the space management recordkeeping system into full operation is a major task for this phase. Real property records contain information on buildings and facilities at an installation. However, data for many buildings must be expanded for space management. The Space Management Section must know what rooms are in a building; what they are used for or what type of spaces they are; their size, characteristics, and features; what alternative uses are possible; to whom they are assigned; and, perhaps, how many persons occupy them. Some space managers like to have a set of building floor plans to mark by color code or other means those blocks of space that are assigned to various users.

(2) Typically, the Space Management Section is not staffed to develop these records and still perform the other activities required. Another way to create records must be found. One method is to arrange a contract with an architectural-engineering firm to survey all facilities and compile and enter data in required records.

(3) Another method is to have users report information about the spaces to which they are assigned. A form and instructions must be created. The advantages of this self-reporting method are work distribution and quick data collection. Weaknesses include the limited accuracy of data submitted and the fact that the major task of loading data into the recordkeeping system still remains. A contract for this clerical task may be needed if support is not otherwise available.

c. Complete staffing of the space management section. During phase 1, temporary staffing arrangements may have been made; however, the staffing effort should continue until a permanent arrangement is completed. This would include creating positions, selecting qualified personnel, extending contract arrangements, and whatever else is needed to provide full support at the level required.

d. Complete implementation of space management operations. Many activities from phase 1 are continued into this phase. Equipment for recordkeeping may have to be procured and furniture may have to be acquired. Procedures may need to be modified or expanded to cover situations not anticipated in phase 1. Training of personnel should be continued.

e. Initiate routine analysis process. An effective tool in space management is to establish an orderly process by which all space assignments and utilization are reviewed periodically. One space management organization created a 2-year review cycle with a schedule. Every assignment was evaluated during each 2-year period. Utilization analysis and site visits were conducted as part of the evaluation process. In phase 2, a routine analysis process should be established and a schedule of activities created. Changes in space assignments and utilization should be monitored as they occur, and a brief report prepared.

f. Initiate special studies and/or a task force.

(1) In phase 2, it is assumed that the Space Management staff has become familiar with its roles and duties and has gained a good understanding of space management. The staff is then in a position to initiate special efforts for improving space utilization and solving space problems.

(a) These special efforts are larger in scale than those resulting from processing individual requests. They typically address solutions to large problems and are based on insight to problems known locally.

(b) For example, the staff may note that organizations spread out over many buildings are inefficient because of physical separation. A large inspection effort may be initiated to identify opportunities for consolidating related activities or closing poorly used buildings. The unequal distribution of administrative office space may be reviewed and a plan developed to make major readjustments in space assignments. A study of future construction may be started to determine if an existing building should be used for permanent assignments. Storage space needs and current inventory may be studied to see what alternatives are possible to solve a storage space crisis. Barracks space needs can be projected based on personnel characteristics and compared to actual use and space assignment to determine if projected needs are accurate.

(2) These special studies can be staffed several ways. The Space Management Section staff alone can conduct them, or a cooperative effort might combine efforts of the Space Management Section and the Master Planning Branch. Two other possibilities are to create a task force to conduct the study and prepare recommendations or to contract a firm with known expertise.

6-4. Phase 3, Full operation

Space management operations will have reached full operation. Phase 1 and 2 activities will continue and minor adjustments will be made to improve operations.

a. *Continue phase 1 and 2 activities.* Records established in earlier phases are kept updated, utilization and related reports are prepared on a regular basis, space change requests are processed routinely, and users are assisted in implementing space changes. Many of these changes will have resulted from special studies or task group efforts. The space management operation is now in a routine operating mode.

b. *Conduct special studies.* Changes in installation mission, organizational structures and staff levels, installation operations, and many other factors produce new demands for space. Special studies should be identified continually to anticipate changes and to respond to them. The Space Management Section cannot depend on user-initiated requests alone to stay ahead of change or to prevent space crisis. Foresight is needed and records and data must be analyzed regularly to optimize space use.

c. *Update space management operations.* The Space Management Section and Space Management Board must constantly evaluate their own policies, procedures, staffing, and interactions with other organizations and user groups. Ways must be sought to reduce paperwork, reach solutions faster, reduce cost for space changes, foster a spirit of cooperation among installation organizations, and assess utilization more effectively. The staff should look to other installations for new ideas and seek training opportunities that may lead to better operations.

Chapter 7 Space Management Board Activities

7-1. Introduction

a. The Space Management Board meets on a regular basis and performs its functions in open sessions. The Board provides overall leadership at the installation in making the best use of space available and helping initiate actions to resolve space problems. The Space Management Board's activities at these meetings can be divided into the following five areas:

- (1) Allocating space.
- (2) Reviewing space management operations.
- (3) Reviewing space utilization reports.
- (4) Initiating special actions.
- (5) If applicable, allocating funds from a special account for space modifications that result from space changes.

b. As noted in chapter 2, the Space Management Board is normally chaired by the Installation Commander (or the Commander's designee). The Space Management Section staff supports Board activities and keeps them moving. It also keeps minutes of Board meetings and prepares the meeting agenda and other materials to be used during the Board meetings. The meetings should be structured around specific proposals and agenda items. Informal coordination should be used when practical.

7-2. Space allocation

The Space Management Board's most common activity is reviewing space allocations as recommended by the Space Management Section and making final space allocation decisions. Procedures for conducting these reviews and making decisions are established locally. Board members may ask users or Space Management Section staff questions about the recommendations, and the Board may wish to send recommendations back to the Staff and users for adjustment

before final decisions are made. The Board may wish to have recommendations provided before the meeting to allow time for study.

7-3. Review space management operations

The Space Management Board is responsible for overseeing space management at the installation. As such, it should conduct a periodic review of space management operations. An annual report to the Board by the Space Management Section is one way to oversee what is happening. In addition, the Board should conduct some form of annual audit, working closely with the Space Management Section. The Board should review procedures, forms, tasks, workload, staffing, equipment, record status, and related items to see how space management at the installation can be improved, simplified, and made faster or more accurate.

7-4. Review space utilization

a. The Board should review annually a space utilization report for the entire installation. Major users should have input as well as the Space Management Section. For example, space utilization reports from a service school, the Directorate of Health Services, the Range Control Office, the DPCA, and other major users could be collected by the Space Management Section and reviewed by the Board.

b. The Board may look at how much space the installation has by space type and how it is distributed. Space requirements can be compared to what is available. The Board may want to look at energy saved, the number of closures, operation and maintenance money saved, or other benefits resulting from space management.

c. The Board may want to meet with the Installation Master Planner, the Installation Master Planning Board, the Range Development Board, and similar organizations or individuals involved in planning for the future. Notes may be exchanged on differences between the way conditions are and the way they should be. The Board, with help from the Space Management Section, may wish to prepare an annual space utilization report for the installation commander.

7-5. Initiate special actions

Special space management actions occasionally may be required. These may include initiating special studies, creating a task force and assigning it a mission, or recruiting special help to deal with mission changes or to develop complete records. These actions may be needed to supplement the Space Management Section's limited staff or to involve other organizations in space management. The need for these special actions may result from analysis of annual utilization data, from special requirements given to the Board, or from other recognition of space management and space distribution problems.

Chapter 8 General Space-Saving Ideas

8-1. Introduction

There are several approaches for saving space that apply to various kinds of buildings. These can be grouped into administrative and facilities techniques.

8-2. Administrative techniques

Administrative techniques are ways of making better use of space without any changes to a facility itself. These include housekeeping, housecleaning, temporary storage, using vertical space, getting proper equipment, and validating authorized use.

a. *Housekeeping.* Space usage must be well planned so that the activities, equipment, and supplies that will be in the space are known and the space is organized for them. A continual problem in all spaces is keeping things picked up and put away. The users get equipment out, bring things into their space to use for awhile, and items may accumulate. An effort is needed to put everything back where it belongs. Part of housekeeping is to provide a place for equipment such as shelving, storage bins, dividers, hooks, racks, and other storage and organizer aids.

b. *Housecleaning.* Administrators occasionally must require user groups to sort through accumulated items to see what can be thrown out. Materials with little value or low use must go. Equipment that is no longer used or obsolete should be returned to general inventory or processed for disposal.

c. *Temporary storage.* Sometimes items that are not used often cannot be thrown out, but there is no place to put them. These items may be retained for some known future use. Materials falling into this category are candidates for temporary storage. Space that is valuable for some activity should not be consumed for storage. Arrangements should be made to store records, equipment, furnishings, and supplies that are not needed often.

d. *Using vertical space.*

(1) Vertical space in offices, warehouses, schools, and other facilities is often used poorly. Stacking items can save much floor space. For example, bookshelves that sit on the floor might be stacked a tier or two higher or replaced by wall shelves. Wall shelves will release floor space when placed above furniture that already consumes floor space

(otherwise, they may not save much space). Bookshelves that sit on the floor might also be replaced by shelf/carrel units that sit on the back edge of a standard desk. In warehouses, shelving systems and different sized bins that fit on them allow vertical storage. In some cases, a mezzanine level or second floor can be constructed if overhead space allows. Besides using wall space for shelves, it can be used for displays, maps, drawings, and similar items.

(2) When changes are made to better use vertical space, care must be taken to ensure that walls can support the loads carried on shelves and that floors can support shelving units. If shelves extend very high, proper equipment for reaching them safely must be included. High shelving may also need retaining devices so that items do not fall onto people below.

e. Maintaining proper equipment.

(1) Equipment that uses a lot of space may not always be necessary. For example, a troop unit may have a forklift truck that is a large, field vehicle. When used in a warehouse, half the building may be devoted to aisle space so the vehicle can be maneuvered. Considerable space might be saved if a smaller industrial truck were obtained.

(2) In addition, a user may have acquired a piece of furniture that is oversized or no longer functional for its original purpose. For example, a library may have inherited some conference tables. At first, when the library collection was small, the tables were not a problem; but, when space became a premium, the tables had to be replaced by some small study carrels. In another example, someone may have picked up a large couch for an office or meeting room. The couch occupied a lot of space for the number of people that could actually use it, so it was replaced by more space-efficient padded visitor chairs. A way to avoid having equipment consume space is to use foldable tables and chairs. For example, if a drafting table is used only once in a while, a foldable one or a table-top drawing board would be more space efficient than a fixed drafting table.

f. Validating authorized use. Some user groups continue to expand their work space rather than solve space problems through housecleaning, housekeeping, and other ways. Organizations will find a way to use unoccupied space if they are not prevented from doing so. The Space Management Section sometimes must determine if space is being used as authorized. The amount of authorized space should be compared to actual space, and the way the space is being used should be checked. A review of personnel may be useful. For example, an organization may have had 50 persons when space was allocated, but was later reduced to a staff of 30. Space that could be used more properly by someone else may be identified by—

(1) Checking staffing charts or personnel records, estimating what space is needed, and comparing required space to that authorized.

(2) Walking through buildings to see how space is actually being used.

8-3. Facilities techniques

Facilities techniques are methods for improving space utilization by adjusting space assignments at the facility itself. Included are consolidation, good layouts, shared space, and changed space standards.

a. Consolidation. When two or more buildings contain unused space, it may be possible to combine occupants into fewer buildings, or occupants may be combined to empty a floor, wing, or bay. The main advantage of consolidation is reducing energy and maintenance costs. The key is locating unused space and deciding if consolidation is possible. If operational problems are created for users and the cost of modification and moving is less than the energy and maintenance expenses that will be saved, the consolidation would not be feasible.

b. Good layouts. Getting the most out of a space is not an easy task. Many persons have difficulty organizing activities, personnel, equipment, and furniture in a space to make maximum use of it. Good layouts can reduce circulation problems, traffic congestion, disturbances, and open space for important uses. The ability to do good layouts requires training, experience, and insight. Many organizations need help in developing an effective layout that works around building components and minimizes modification costs. The Space Management Section or the Design Branch in the DEH may be asked to help solve problems through layouts.

c. Shared space. Use of shared spaces, such as conference and meeting rooms, can be increased through scheduling. If a method for scheduling the use of such spaces does not exist, someone or some organization should be given that responsibility. In addition, frequency and hours of use should be checked to determine if shared spaces are being used effectively. Shared space use might also be increased by analyzing attendance and considering subdividing a larger room. Two groups of 20 can use a room designed for 40 if partitions are installed. Folding partitions that limit sound transmission can be opened when a room for 40 is needed.

d. Reduced space standards. Sometimes there is a shortage of some space type. Thus, although every effort is being made to supply additional space through conversion, modification, or new construction, it may be necessary to crowd operations together. Keep in mind that narrowing of aisles and blocking required exit doors are not acceptable space-saving ideas. Local space standards may have to be established that are below DOD or DA allowances so that users share equally in the shortage. Crowding can be tolerated for awhile, but could reduce worker morale if continued for too long. Effects might include increased absenteeism, employee turnover, conflicts among personnel, and reduced productivity.

Chapter 9 Administrative Offices

9-1. Introduction

Space management has two main objectives, which are resolving space shortages when the space available is less than needed and helping users conserve space when they are occupying more space than authorized. Space allowances were developed with the older, larger furniture styles in mind. Many available furniture styles require less space, especially the “clustered” or modular workstations. Thus, not all workstations will meet space standards for furniture or personnel. The Space Management Section must strive to ensure that the quality of the work environment is not downgraded when using an interim solution to resolve space shortages. This section discusses several ways to conserve or to use space in administrative facilities more efficiently.

9-2. General layout

a. Private offices, shared areas, and open plan.

(1) Most employees desire private offices. Although these are authorized for some employees, they are space-intensive.

(2) Some high-level offices are sized to provide conference areas within the same room, whereas some merely provide work areas. In an executive suite, some office space might be saved by pooling conference areas or parts of conference areas included in office allowances into one shared conference room. Therefore, each office could have space for small groups, but others could use the large conference room when the executive office does not need it.

(3) Private offices require more space than comparable workstations in open plans because of the enclosing walls. Space efficiency also is lost due to furniture arrangement problems, such as working around doors, windows, electrical outlets, and similar features.

(4) When an organization moves into a building, the number of persons in each pay grade and the number of authorized private offices will differ from the organization that occupied the space previously. Thus, some persons moving into private offices will have less space than authorized, whereas others will have more than they are authorized. As a result of room sizes not matching the authorized amounts exactly, there is usually 10 to 20 percent inefficiency for private offices when a group moves into a building not designed for them.

(5) If the same workstation is moved from a private office to an open plan office, there is typically a 25 percent space savings. However, middle and lower managers often have difficulty making this transition, and some may feel they are not getting what they are authorized according to standards.

b. Office automation.

(1) Computers and other automated equipment are being added to offices at an increasing rate. In general, office automation adds about 15 to 20 percent to space needs. Requirements for individual workstations vary considerably because there are many different kinds of equipment.

(2) Office automation can create serious space quality problems. The equipment requires more power and communication lines, which generate some heat. Lighting and placement of monitors or video display terminals (VDTs) relative to windows is critical in minimizing screen glare. Heights for VDTs, keyboards, and adjacent writing surfaces must all be different. Adjustability of chairs and worksurfaces also is very important particularly when automation equipment will have extended use; therefore, old furniture may not be suitable. Special consideration with regard to fire detection and suppression systems may be required as office automation increases. This is particularly true of computer facilities.

9-3. Workstation layout

a. Resolving space shortages.

(1) In situations for which a space shortage is installation-wide, care must be taken to assure equitable distribution of space. Space may often be saved by rearranging furniture and equipment. Revised installation space standards could be used during temporary space shortages as an interim solution. The following techniques may be used to resolve space shortages and increase space utilization.

(2) An important step in improving space usage is “cleaning house,” or throwing out unneeded papers and items. Increased use of vertical shelving will reduce the amount of floor area required to store books, papers, and other articles. Existing furniture can be rearranged to reduce the floor area needed for circulation. (Safe egress must be maintained in case of fires.) Bookcases, files, and dividers can be used to increase privacy when more than one person occupies a room. Temporary storage may be used to store items that are used infrequently but which must be retained. Scheduled use of shared spaces such as conference rooms, classrooms, training areas, and auditoriums will enable more people to use the spaces. Finally, the use of proper equipment for the task will produce space savings. Modular or “systems” furniture can be used to reduce the amount of space required per workstation. (See para *d* below.)

b. Conventional furniture.

(1) Conventional, freestanding furniture requires the most space in offices. However, if only conventional furniture is available, there are some steps for using less space.

(2) One way to save space is to replace 36-inch-deep desks with the 30-inch-deep ones. Another way is to place

desks with the backside against the wall. (See fig 9-1.) This will make better use of space than having the desk with one side to the wall because with the back to the wall, vertical wall space can be used for convenient shelving. However, some persons do not like to have their desk facing a wall or panel because they feel closed in. Some prefer to use their desk as a barrier by placing it so visitors must sit across the desk from them. They may feel uncomfortable when someone sits next to them or faces them without a barrier.

c. Conventional furniture with movable partitions.

(1) Workstations with conventional furniture can be placed quite close together, yet retain some privacy when movable partitions are used to separate them (fig 9-2). Workstations arranged this way each require about 60 square feet. Furniture components, such as files or book cabinets, can also be used to separate workstations, thus providing some privacy and defining what space belongs to each workstation.

(2) When many workstations are organized in a large open-plan office room as shown in figure 9-2, the regimented layout, long aisles, and repetition make the work area unpleasant for many persons. Breaking the work area into smaller sections will make it more acceptable. (See fig 9-3.)

d. Clustered workstations.

(1) The regimentation shown in figure 9-2 can also be avoided by using clustered workstations. This arrangement may even reduce the amount of space required for a workstation.

(a) It is assumed that workstations in a cluster will be separated by movable partitions or partitions that are part of the furniture system. Figure 9-4 shows clustered workstation arrangements for conventional furniture. Figure 9-5 shows clustered workstations for modular furniture.

(b) Although most clusters consist of four workstations, modular furniture systems are available for five- and six-workstation clusters. Each workstation in a modular, four-workstation cluster may occupy as little as 35 square feet; each workstation in a six-workstation cluster may require as little as 25 square feet.

(c) Workstation privacy is greatly influenced by the amount of enclosure. Workstations in figure 9-4 are almost fully enclosed, whereas those in figure 9-5 have only two sides with partitions. The workstations in figure 9-4 will provide much more privacy and, as a result, greater worker satisfaction.

(2) When planning clustered workstations, it is important to match the workstation features with user requirements. Modular furniture can be selected and arranged to provide workstations suitable for many employee activities. However, clustered workstations are not suitable for everyone; they are essentially a place to sit and do work. Managers and other employees who have many visitors would disturb their neighbors in an open plan office. Thus, they would probably be better placed in a private or semiprivate office.

(3) Shared conference rooms can be used for meetings to keep noise levels down. Acoustical partitions used to separate workstations provide some noise attenuation as well as visual privacy. Clustered workstations often have built-in lights and work surfaces with adjustable heights. Disadvantages of using clustered workstations include a possible shortage of storage space and the placement of workers near traffic zones.

e. Sound control as a space-saving method. Workers sit close together in open-plan offices, often making noise a problem. Noise is transmitted directly to others or is reflected from windows, panels, or the ceiling. Noise sources include conversation, office machines, nearby traffic, and other office activity. Most persons find tightly spaced workstations more acceptable if sound is controlled so that crowding is not noticed as much. Sound can be controlled in several ways, including sound-absorbing panels and ceilings, layouts that minimize reflections from hard surfaces, and masking. Sound is "masked" by introducing "white noise," background noise that is distributed across audible frequencies to sound much like a soft waterfall.

9-4. File systems

a. Centralized files.

(1) One way to reduce office space is to centralize files. This saves space because fewer copies of materials are kept in file cabinets. The idea of "my copy" becomes "our copy." In addition to reducing stored materials, the inefficiencies of having furniture scattered all over are reduced. When files are placed next to each other, there is little waste due to access needed around the cabinet. Figure 9-6 shows the reduction in aisle space when two facing sets of drawers can be opened into the same space.

(2) An important consideration when files are centralized is structural safety. Because centralized files will create heavy floor loads, care must be taken to ensure that the floor and supporting structural elements will be able to carry the concentrated weight.

b. Style of file cabinets. In addition to centralizing files, the choice of file cabinets can save space.

(1) *Lateral files.* Probably the most common type of file cabinet is the five-drawer conventional cabinet. The drawers are about 30 to 36 inches deep. File access space can be saved when lateral files are used because the drawers are only about 12 inches deep; thus, less file space must be reserved to open the drawers fully. Figures 9-6 and 9-7 compare conventional and lateral files. Some types of lateral files can be stacked two sections deep. The front row can be moved sideways and, when one unit is left out, the rear row is accessed by moving the front cabinets to the side. This arrangement makes lateral files even more efficient. Figure 9-8 shows this arrangement.

(2) *Rotating file cabinets.* Another type of lateral file cabinet rotates on a base. These units can be rotated for access

from one or both sides. They are typically two sections deep, each opening to one side. These units save space because access needs are reduced. Some efficiency is given up because the rotation requires some space along the sides. However, these units allow for more flexible applications. (See fig 9–9.)

(3) *Ferris wheel file units.* Another type of lateral file makes better use of vertical space. This type of unit saves space because files can be kept well above eye level, the normal limit for ease and safety in use. Several file shelves are enclosed in a mechanically driven unit and are suspended so that they move in a rotating path. Only one or two shelves are accessible at once. Others are moved into position by pressing a button that rotates the shelves on their suspension. (See fig 9–10.)

(4) *Movable aisle systems.* When many file cabinets are placed together, aisle space must be provided between rows. These aisles must be wide enough so that users can open drawers and look through materials. Some large file and shelving units can be obtained that keep most rows placed together with no aisle space between them. Thus, only one or two aisles are provided in the entire system. The rows are powered so that an operator can push a button, cause a row to move over, and open the aisle space at a new location. Safety devices are built in so that someone does not get caught between rows when the aisle is closed. Because aisles are nearly eliminated, considerable space is saved. Some of these file systems are combined with the ferris wheel type to make full use of vertical space. Figure 9–11 shows movable aisle file cabinets.

Chapter 10

Storage Space and Warehouses

10–1. Introduction

a. The following documents comprehensively detail all aspects of storage and warehouse space control, utilization, allocation, conversion, management, and reporting. Guidelines governing storage space control and utilization are contained in DOD 4145.19–R–1, chapters II, V, and VII; TM 743–200–1, chapters 2 and 5; and AR 405–70. Guidelines governing storage space management and reporting are contained in DOD 4145.19 (which includes DD Form 805) and AR 740–1, chapters 5 and 6. The DEH Space Management Section must work closely with the appropriate element of DIO in dealing with storage and warehouse space management.

b. The DIO at each activity must prepare and submit a DD Form 805 (Storage Space Utilization and Occupancy Report) in accordance with AR 740–1. The guidance presented here is intended to help the Space Management Section understand space management and space utilization in storage and warehouse facilities. It is not intended to replace or supersede any existing regulations.

c. For assistance with storage and warehouse space management and utilization matters, contact the Director, AMC Packaging, Storage and Containerization Center, ATTN: SDSTO–TO Tobyhanna Army Depot, Tobyhanna, Pennsylvania 18466–5097. Phone: Autovon 795–7109.

10–2. General considerations

a. The main objectives for warehouses and storage facilities are to—

- (1) Optimize space use.
- (2) Minimize handling and distance traveled.
- (3) Maximize use of labor and equipment.
- (4) Protect stored materials from weather, fire, damage, and theft.

b. These objectives are affected by several factors such as the need for environmental and temperature controls; size and variety of materials to be stored; whose materials are being stored and the need to access them; whether items are bulk materials; and how much control must be placed over the stock and its replacement. Thus, space utilization is just one factor affecting decisions about warehousing and storage. This discussion is limited to a few space-saving methods. (See TM 743–200–1 for details on implementation and effectiveness of the general ideas described in paragraphs 10–3 through 10–12.)

10–3. Reduce number of items stored

One way to make good use of storage and warehouse space is to discard items that should not be stored. Items no longer in use or that will never be used are good candidates for disposal. Old stock may not be useful anymore and also should be removed. The storage space can be used for other items or a storage facility can be closed to conserve energy, operations, and maintenance costs.

10–4. Use stock management

a. One philosophy for stock management is called “fixed location storage.” Each item is placed in a certain specified location. Grocery stores use fixed location storage to display items. This type of location storage assigns a certain amount of space to each item, regardless of how many of each item are currently in stock.

b. Another philosophy is called “random location storage.” In this approach, any item can be stored at any location.

Items are continually moved to new locations to make good use of space and to adjust stock location based on demand. Selected items frequently are kept close to the distribution window or dock. Random location storage requires less space than fixed location storage; however, records must be maintained to keep track of the current locations of the items.

c. A stock management practice that can affect storage space is related to ordering and inventory control. The minimum quantity of each item and the minimum amount of space needed must be known. Reorder times, reorder quantities, and delivery times must be controlled carefully, but conform to mission requirements. These management practices will minimize the inventory and amount of storage space required.

10-5. Reduce aisles

a. Aisles consume a large part of the floor area in storage buildings. The more aisle space, the less efficient a storage facility is because efficiency is based on space volume. Table 10-1 gives recommended aisle widths. Two methods for minimizing aisle width are (1) using the right material-handling equipment (equipment that requires as little aisle space as possible for the type of storage facility and operations), and (2) using one-way traffic where possible. One-way traffic allows aisles to be sized smaller than those in which vehicles must be able to pass each other in opposite directions. A wide range of material-handling equipment and industrial trucks are available. Manufacturers' catalogs should be consulted when selecting equipment to reduce aisle space.

Table 10-1
Recommended aisle widths for two-way traffic

Use: Manual carrying
Width (feet): 4

Use: Handcart or handtruck
Width (feet): 4

Use: 1-ton fork truck
Width (feet): 8-10

Use: 2-ton fork truck
Width (feet): 10-12

Use: 3-ton fork truck
Width (feet): 12-14

b. Another method for reducing aisle space is to ensure that deep shelf units are used (for example, shoving shelf units back to back where practical). In addition, aisles normally should not run along walls; shelf units placed along walls will improve space utilization. (See fig 10-1.) However, if vehicles are used, shelving located perpendicular to the general traffic flow could be at risk for damage.

10-6. Organize

Storing items carelessly or deciding where items should be stored when they arrive is space-intensive. It is important to *plan* for use of warehouse space and organization of items. One good way to organize is to group small, medium, and large items separately. Materials that fit on shelves should be separated from pallet units or transportation containers. Bulk materials also should be separated. Materials with hazards (flammable, toxic, or corrosive) have special storage requirements.

10-7. Optimize layout

a. Good warehouse layout can improve space utilization. Traffic flow should be analyzed and patterns should be selected to reduce congestion and avoid competing activities.

b. The popularity of items should be determined and the more popular ones should be located near distribution points; items seldom needed should be located away from the distribution window or dock.

c. Good traffic patterns and organization will reduce the need for ancillary space, such as that used for temporary placement of items during receiving or storage of prepared orders. Dock space can sometimes be reduced by using good layouts or by ensuring that dock plates and other equipment are available.

10-8. Use storage racks and shelving systems

a. Many patented shelving and rack systems are available for warehouses and storage facilities, although special systems may be needed for uncommon and odd-shaped items. Racks and shelving systems help organize storage space. Most are designed to make good use of vertical space, and some are combined with particular material handling vehicles, conveyors, and equipment to allow storage higher than would otherwise be possible.

b. Bulk materials should be stored in bins, vats, or other special containers. Some kinds of bulk materials do not require indoor storage.

c. When several users have items stored in the same facility, a system is needed to prevent items belonging to one organization from getting mixed up with those from another. One way to help organize storage for this problem is to provide compartments using steel screen or other partitioning. Compartments can be locked and accessed only by parties to whom they are assigned or by others with authority.

10-9. Fire suppression considerations

Fire protection personnel should be consulted before any changes are made in storage configurations or materials. Frequently, sprinklers have been designed and installed in warehouses to support a particular class or configuration of storage. Changes can render the level of protection inadequate. For example, a sprinkler designed for general storage will not be adequate to protect tires, or sprinklers designed for a particular configuration of racks must be redesigned if the rack configuration is changed.

10-10. Add a floor

The capacity of an existing warehouse or storage facility can sometimes be expanded by adding a second floor or mezzanine within the building. Retrofit structural systems are available that allow an interior elevated level to be created without much modification to the building. Access ramps and stairs must be included in the change. Load capacities of floors, foundations and soils, and walls must be checked carefully. Cost analyses and utilization improvement must be included in a decision for this concept.

10-11. Use automated storage and retrieval systems

If a warehouse serves as a distribution center and has a high traffic volume, an Automated Storage and Retrieval System (AS/RS) may be needed to make the best use of the space. A variety of these hardware-intensive systems are available. Since they are expensive to install, considerable study and planning is needed to select and design the installation. Help should be obtained from specialists; the Army's specialists are located at the Tobyhanna Army Depot, Tobyhanna, Pennsylvania.

10-12. Evaluate space usage

Warehouse space should be analyzed to determine how well it is being used. Results of the analyses are used to adjust space to improve use. The Space Management Section should obtain a copy of DD Form 805 (Storage Space Management Report) each time it is prepared by DIO. TM 743-200-1, paragraphs 2.6.4, explain how to conduct a storage space survey.

Appendix A References

Section I Required Publications

AR 405-70

Real Estate: Utilization of Real Estate (Cited in para 10-1.)

Section II Related Publications

A related publication is merely a source of additional information. The user does not have to read it to understand this pamphlet.

AR 210-17

Inactivation of Installations

AR 210-20

Installation: Master Planning for Army Installations

AR 210-21

Army Master Range Plan

AR 405-90

Real Estate: Disposal of Real Estate

AR 415-28

Construction: Department of the Army Facility Classes and Construction Categories (Category Code)

AR 740-1

Storage and Supply Activity Operations (DD Form 805)

DG 1110-3-104

Administrative Office Facilities

This publication may be obtained from USACE Publications Depot, 2803—52nd Avenue, Hyattsville, MD 20781

DG 1110-3-106

U.S. Army Service Schools This publication may be obtained from USACE Publications Depot, 2803—52nd Avenue, Hyattsville, MD 20781

DOD 4145.19

Storage and Warehousing Facilities and Services

DOD 4145.19-R-1

Storage and Materials Handling

DOD 4270.1-M

Construction Criteria Manual

DRIS Reg 4000.19-R

Interservice, Interdepartmental, and Interagency Support This publication may be obtained from Director, Navy Publications and Printing Service, Eastern Division, Building 4, Section D, 700 Robbins Ave., Philadelphia, PA 19111

IFS User

This publication may be obtained from the IFS Support Branch, ATTN: FESA-FI, Building T11206, Fort Lee, VA 23801-6110

TM 5-803-4

Planning of Army Aviation Facilities

TM 5-803-12

Planning and Design of Outdoor Recreation Facilities

TM 743-200-1

Storage and Materials Handling

Section III

Referenced Forms

DA Form 2496

Disposition Form

DA Form 4283

Facilities Engineering Work Request

DD Form 805

Storage Space Management Report

Appendix B Example Space Management Reports

B-1. Reports generated from IFS and other records

A variety of reports can be produced from space management records. Some examples in this appendix illustrate reports that can be generated from the Integrated Facilities System records. Reference can be made to the *IFS User's Manual* for further information. Another group of example reports are produced manually or from other computer systems. The examples in this appendix are grouped as follows:

a. Integrated Facilities System (IFS).

- (1) Space Utilization Report by User (Assets Accounting Module).
- (2) Master Schedule Report (FEMS Module).
- (3) Standing Operations Order Report (FEMS Module).

b. Other reports.

- (1) Space Required Versus Actual Space.
- (2) Space Quality.
- (3) Analysis of Barracks Space.
- (4) Space Analysis by Building.
- (5) Location Utilization Report by School Department.

B-2. Example a(1)

a. System/method. IFS.

b. Title. Space Utilization Report by User.

c. Description. A building can be broken into individual spaces or groups of spaces. Some data at this level can be entered into the IFS. This report can be compiled from subdivided space. (See fig B-1.) Notice that the subtotals give the total square feet assigned to a user in each building. A grand total describes what is assigned to the user.

B-3. Example a(2)

a. System/method. IFS.

b. Title. Master Schedule Report.

c. Description. In the IFS, data can be maintained on time spent in different activities. This report can be used to summarize the time spent on activities over a given period. (See fig B-2.) Subcategories can be created for each of several space management activities. The subcategories can describe activities like those discussed in chapter 4 or could be names of major projects. (See also example a(3).)

B-4. Example a(3)

a. System/method. IFS.

b. Title. Standing Operations Order Report.

c. Description. This report also can be used to compile data for time spent on various space management activities. (See example a(2).)

B-5. Example b(1)

a. Method. Line graph.

b. Title. Space Required Versus Actual.

c. Description. Figure B-3 shows how line graphs can be used to compare information about space. Line graphs can explain trends. This graph, for example, shows that a moderate shortage will exist over a 3-year period.

B-6. Example b(2)

a. Method. Bar graph/histogram.

b. Title. Space Quality.

c. Description. The stacked bar graph or histogram in figure B-4 shows how space quality can be analyzed after a visit and rating. This type of graph is useful for explaining and understanding the status of building stock.

B-7. Example b(3)

a. Method. Tabulation.

b. Title. Analysis of Barracks Space.

c. Description. Figure B-5 shows how a tabulation of space management data can be used to analyze space required compared to space actually assigned. Various formats can be used and are normally determined by the kind of analysis

that must be done and the contents of the spreadsheet. This kind of tabular data gives precise information, but is not as useful as graphical presentations (figs B-3 and B-4) in showing the overall picture or explaining trends.

B-8. Example b(4)

- a. Method.* Pie chart.
- b. Title.* Space Analysis by Building.
- c. Description.* This report shows what spaces comprise a building. (See fig B-6.) When several buildings are compared, it will show if a building is inefficient; for example, excess space may be used for circulation. Other comparisons using different descriptors can be used for analyzing space, such as for comparing assigned space versus unassigned space.

B-9. Example b(5)

- a. System/method.* AIMS (Automated Instructional Management System) (POC is ATSC; Fort Eustis, VA 23604).
- b. Title.* Location Utilization Report by School Department.
- c. Description.* This report (fig B-7) can be produced from the AIMS system being brought online for Army Service Schools. (System distribution began in FY 84 and will not be complete for several years.) In the system, training spaces can be scheduled for class or student use. How fully a training space is used can be determined from this report. This kind of report can be forwarded to the Space Management Section from a major user (here, a service school).

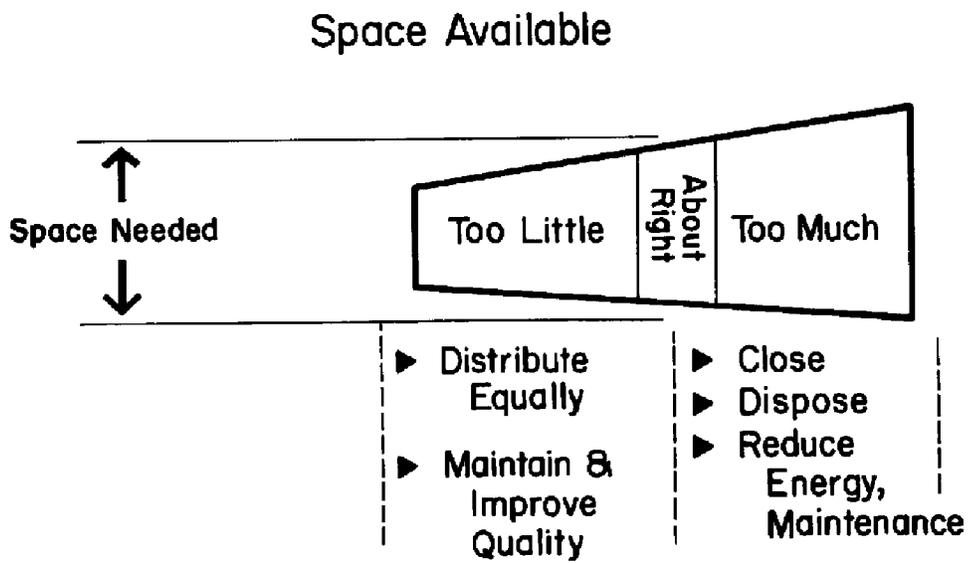


Figure 2-1. Space management goals vary with the space available and space needed

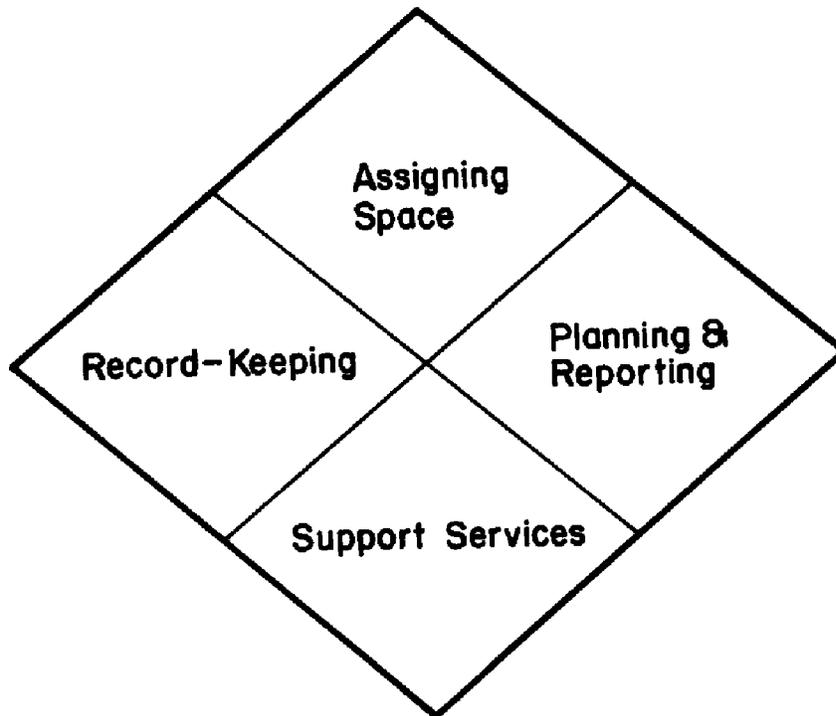


Figure 2-2. The four functions of space management

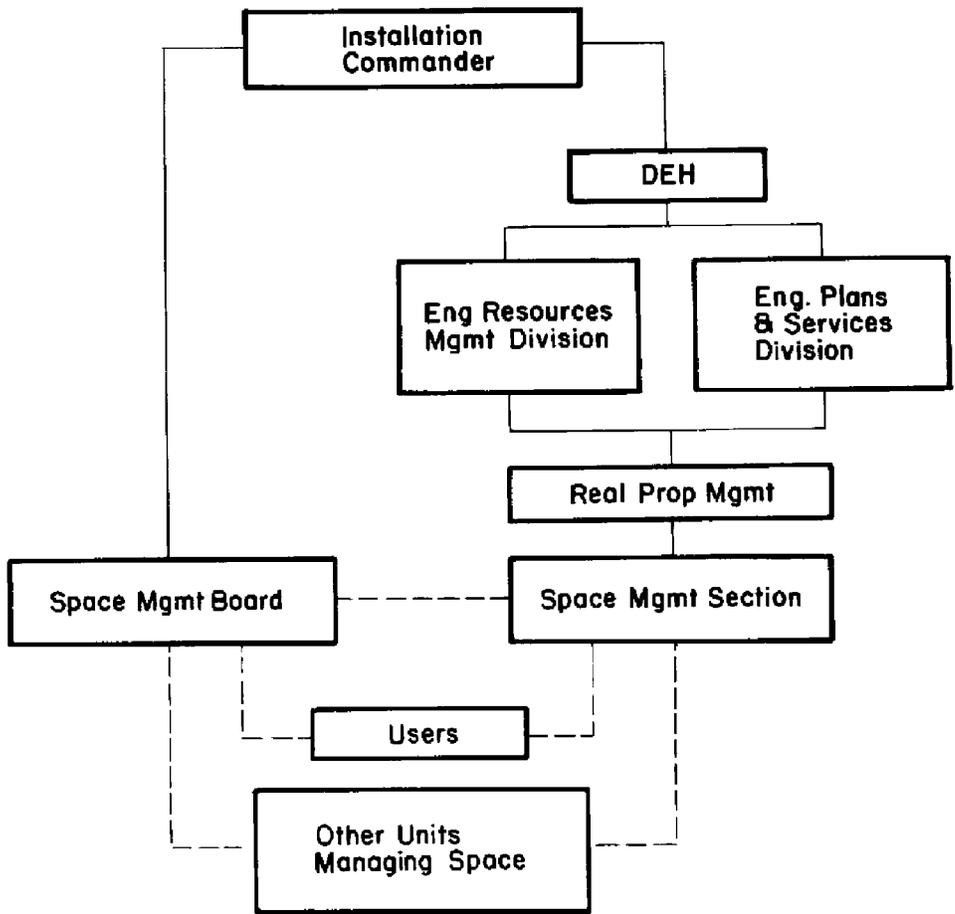


Figure 3-1. Recommended organizational structure for space management

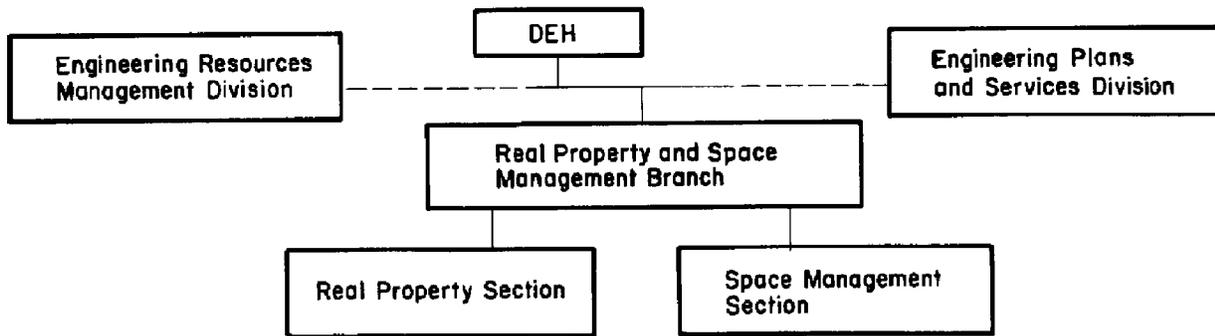


Figure 3-2. Recommended location for a space management office

Purpose

The purpose for the Space Management Board is to oversee space management policy and procedures at the installation and to allocate space to users. This includes all types of facilities and space except housing.

Objectives of space management

The purpose of space management is to obtain the most efficient utilization of space to:

- (1) Conserve energy.
- (2) Minimize maintenance and other operating costs.
- (3) Retain adequate quality of work life.
- (4) Provide equitable distribution of space.
- (5) Minimize new construction.

Responsibilities

The Space Management Board will—

- (1) Assign and/or release facilities and space.
- (2) Establish installation space management policy and procedures.
- (3) Conduct an annual space utilization review.
- (4) Initiate special actions or create special organizations necessary to accomplish space management objectives.
- (5) Conduct regular meetings open to all installation organizations.
- (6) Prepare an annual installation space management and utilization report.

Members

The following are members of the Space Management Board:

- (1) Deputy Installation Commander (Chairman).
- (2) Director of Engineering and Housing (Secretary).
- (3) Heads of all other directorates and major combat units.

When tenant organizations do not have direct representation on the Board, Board members will be assigned to serve as the representatives for specific tenant organizations. The Space Management Section staff will serve as clerk and recorder.

Operating procedures

The Space Management Board will establish regular meeting times, locations, and meeting procedures. The Space Management Section will—

- (1) Prepare the agenda and materials for use during Board meetings.
- (2) Prepare the annual report for the Board.
- (3) Assist the Board in all other space management matters as required.

Figure 3-3. Proposed guidance for establishing a Space Management Board

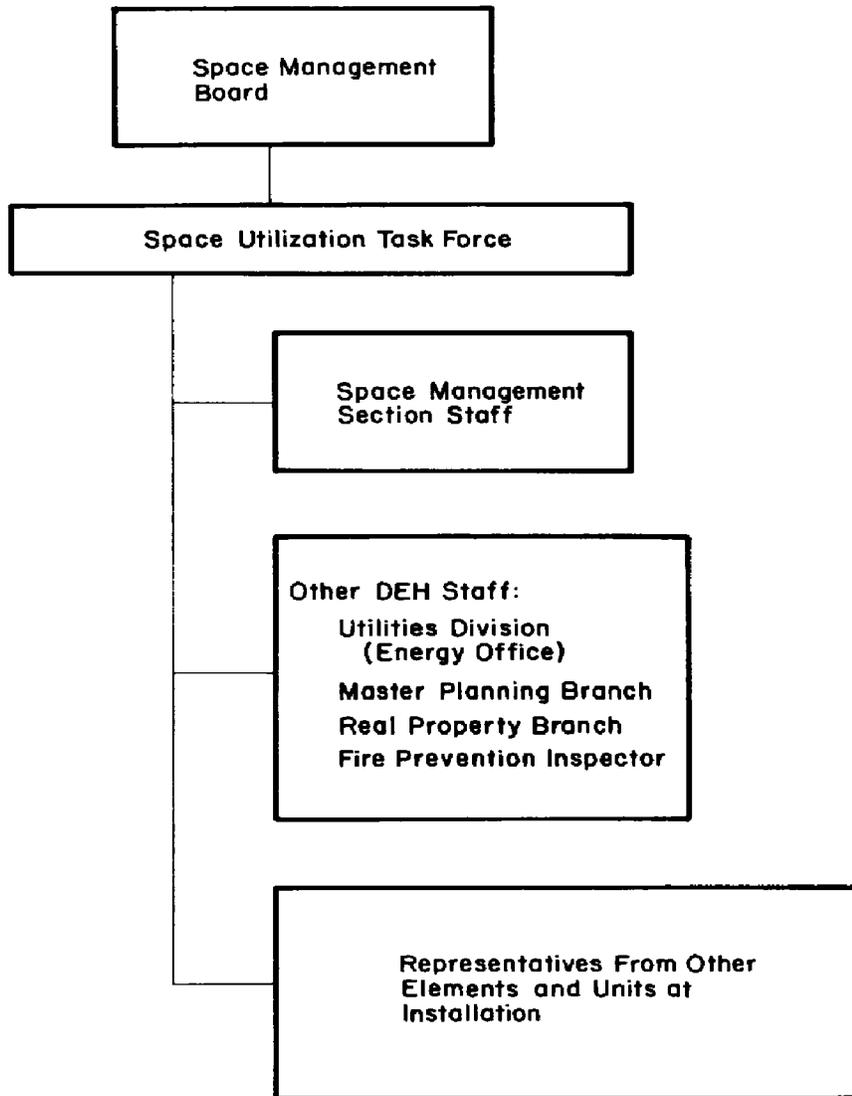


Figure 3-4. Possible structure for a space utilization task force

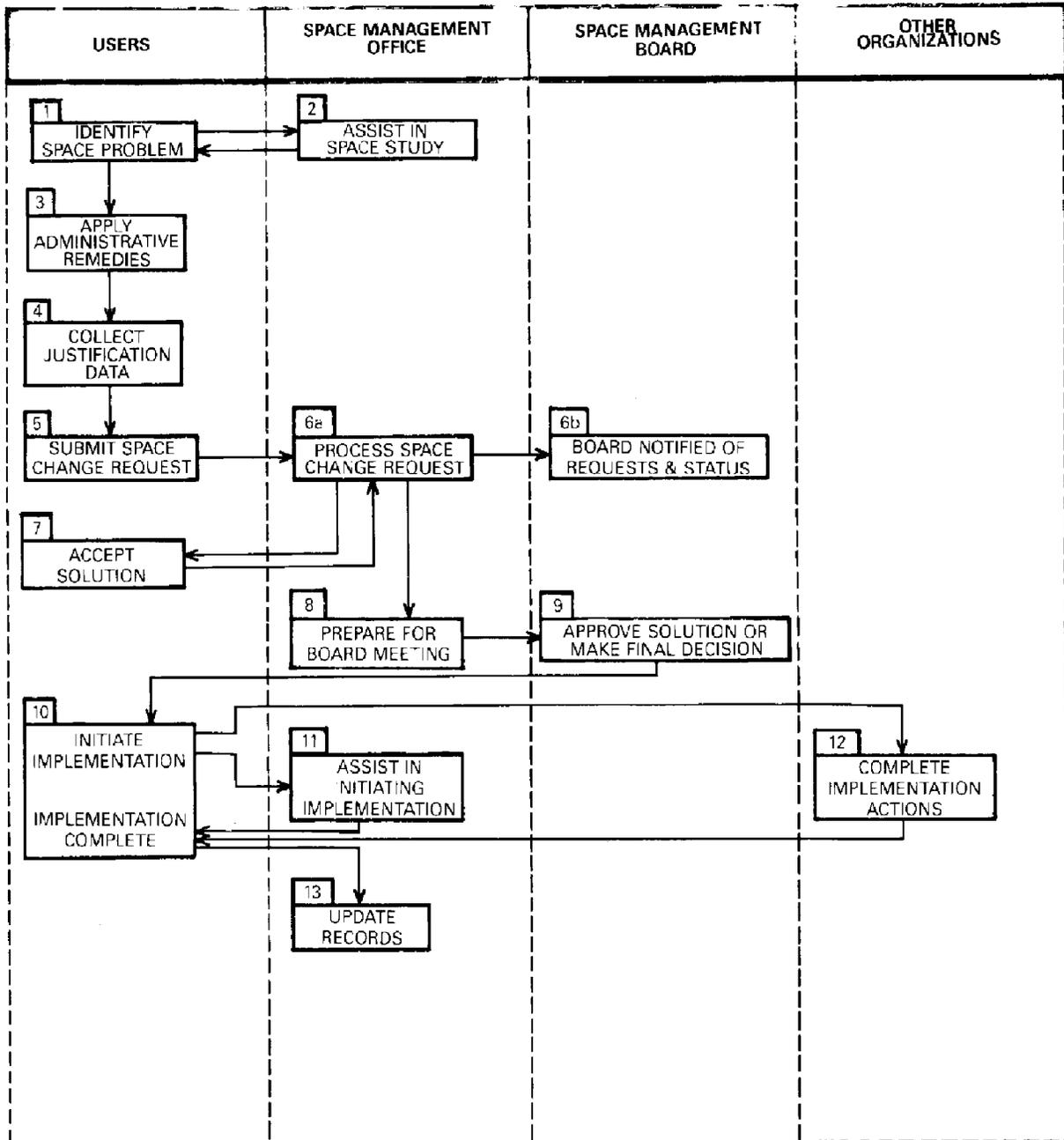


Figure 4-1. The space assignment process

Typical contents of a space change request

1. Purpose of request (new space, relocation, add space, etc.).
2. Summary of current problem or situation.
3. Requirements-
 - Type of space.
 - Amount, size.
 - Location.
 - Quality, special features.
4. Construction, modification or renovation requirements.
5. Furniture and equipment requirements.
6. Schedule or time constraints.
7. Moving requirements.
8. Summary of costs and funding sources.
9. Justification and supporting data-
 - What caused need for change?
 - Staffing chart.
 - TOE, TDA structure.
 - Proposed layout etc.
10. Impact if not approved.

Figure 4-2. Sample checklist of data for a space change request

SPACE MANAGEMENT		LOG OF REQUESTS AND ACTION ITEMS					
Item Number	Status/Date				Submitted By	POC/Phone	Type of Request/Action
	Received	Solution Accepted	Approved by Board	Implementation Complete			
85-210	4/1/85	4/16/85	4/30/85	6/16/85	COL. BANKS	X 464	NEED NEW OFFICE SPACE/ REALLOCATE EXIST SPACE
85-211	5/12/85	6/6/85			MAJ. LUND	X 217	NEED ADDITIONAL STORAGE/ INSTALL VERTICAL SHELVING
85-212	5/23/85				SGT. TORK	X 516	NEED MORE CONFERENCE SPACE/CONVERT CLASSROOM

Figure 4-3. Sample log of requests and actions

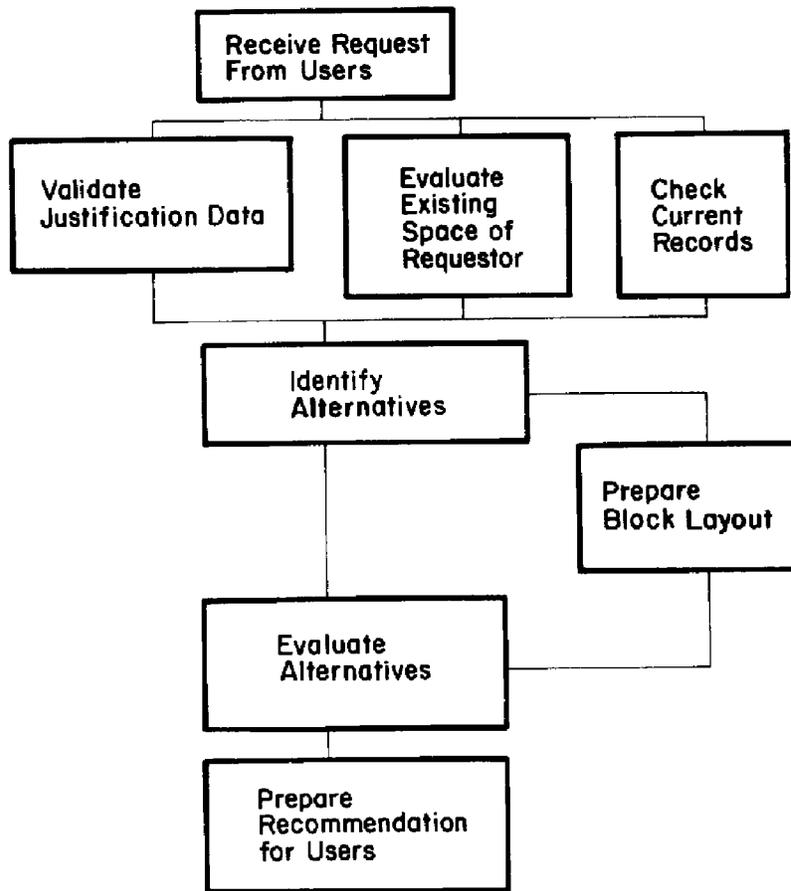


Figure 4-4. Typical tasks performed by the Space Management Office in processing a request

SPACE EVALUATION CHECKLIST

SPACE NAME/NUMBER CLASSROOM/219 DATE 9/85
 BUILDING ABC CENTER COMPLETED BY RLB
 ROOM DIMENSIONS 30' Lx 20' Wx 12' H

TYPE OF SPACE/DESCRIPTION

<u>OFFICE</u> Administrative Office Spaces Conference Rooms Other _____	<u>TRAINING</u> Classroom spaces/ Conference Classrooms Laboratory spaces/ Instructional shops Laboratory - Classrooms Self-Paced Instruction Rooms Seminar Classrooms Auditorium/Theater Other _____	<u>TRAINING SUPPORT</u> Instructor Preparation Areas Instructor Rehearsal Room Counseling Spaces Remedial Instruction Spaces Technical Library Study areas Projection Rooms Other _____	<u>SHARED USE</u> Student Lounges Snack Bar/ Vending Areas Bookstore Latrines Janitor Closets Other _____ <u>Mechanical</u> Other _____
--	--	---	--

DOES REQMT. EXIST	REQUIREMENT	REQMT. SATISFIED		COMMENT/PROBLEMS
		YES	NO	
Y	A. <u>SPACE</u> 1. <u>Size (amount of space)</u> 2. <u>Dimensions (L,W,H.)</u> 3. <u>Shape</u> 4. Distance between columns.			SIZE OKAY
Y	B. <u>ACCESS/CIRCULATION</u> 1. Seeing in or out 2. Not seeing in or out 3. <u>Doors & openings</u> a. Dimensions b. Opening & closing c. Locks	✓		CAN'T ORGANIZE ACTIVITIES WELL
Y	4. Distance to other spaces' applicable runs, walking. a. Horizontal b. Vertical 5. <u>Access to other spaces</u>		✓	BRIEFING ROOM SHOULD HAVE DOOR OPENING TO BAYS. NOW ONLY ENTRY IS THROUGH INSTRUCTOR SPACE.

WORK SHEET

Figure 4-5. Sample checklist for evaluating space quality

DOES REQMT. EXIST	REQUIREMENT	REQMT. SATISFIED		COMMENT/PROBLEMS
		YES	NO	
Y	C. UTILITIES AND WASTE			
	1. <u>Electrical Service</u> a. Voltage (110 assumed) b. Current c. Power d. Fluctuation limits e. Receptacle location f. Special controls g. Control locations.	✓		
	2. <u>Water</u> a. <u>Cold</u> b. Hot c. Quantity d. Location.	✓		
	3. <u>Solid Waste</u> a. Type b. Amount or capacity.	✓		
	4. <u>Sanitary Sewer</u> a. Capacity b. Location.	✓		
	5. <u>Special Sewer or Waste</u> a. <u>Type of waste</u> b. Location c. Capacity.		✓	MUST PROVIDE WASTE OR COLLECTION SYSTEM TO STOP SPILLS FROM ENTERING SANITARY SEWER.
	6. <u>Special Gases or Fluids</u> a. <u>Compressed air</u> b. Other gases c. Special fluids d. Pressure e. Capacity f. Location.			NEW OUTLET IN BAY #3 FOR TIRE CHANGING MACHINE
Y	D. ENVIRONMENTAL CONDITIONS			
	1. <u>Lighting</u> a. <u>General light level</u> b. <u>Task Lighting</u> c. Controls d. Lighting quality.			NEED TASK LIGHTING OVER PARTS WASHER IN BAY #3
Y	2. <u>Sound and Noise</u> a. Not being overheard b. Isolation from outside sounds c. <u>Control of speech interference.</u>		✓	SOME SOUND CONTROL BETWEEN BAYS WOULD HELP. IT IS DIFFICULT TO HEAR MANY TIMES.

Figure 4-5. Sample checklist for evaluating space quality—Continued

DOES REQMT. EXIST	REQUIREMENT	REQMT. SATISFIED		COMMENT/PROBLEMS
		YES	NO	
Y	<u>3. Thermal Conditions</u> a. Comfort heating b. Comfort cooling c. Comfort ventilation d. Humidification e. Air movement f. Heating or cooling for equipment.	✓		
Y	4. Air Quality a. Odor control b. Dust control <u>c. Gas or vapor control.</u>		✓	VEHICLE EXHAUST SYSTEM DOESN'T ALWAYS WORK PROPERLY.
	5. Radiation a. Shielding for ionizing b. Shielding for nonionizing radiation.			
Y	<u>F. APPEARANCE/FINISHES/IMAGE</u> 1. Floors a. Non-slip b. Static-free c. Acid-resistant <u>d. Maintenance & cleaning characteristics</u> e. Appearance/image characteristics f. Heavy loads and traffic.	✓		NEW COATING MAKES CLEANING MUCH EASIER THAN BEFORE.
Y	2. Walls a. Appearance/image characteristics b. Maintenance & cleaning characteristics <u>c. Special uses (charts, maps, etc.)</u>		✓	A PLACE FOR TRAINING CHARTS IS NEEDED IN BAY #1. EASELS GET KNOCKED OVER.
	3. Ceiling a. Appearance/image characteristics b. Special provisions.			
Y	<u>F. COMMUNICATION</u> <u>1. Telephone instruments</u> 2. Dedicated lines (hotlines, data lines) 3. TV receptacles & lines <u>4. Speaker system.</u>		✓	A TELEPHONE INTERCOM TO EACH BAY WOULD BE LESS DISRUPTING TO CLASS THAN THE ONE SPEAKER SERVING ALL BAYS.
Y			✓	

Figure 4-5. Sample checklist for evaluating space quality—Continued

DOES REQMT. EXIST	REQUIREMENT	REQMT. SATISFIED		COMMENT/PROBLEMS
		YES	NO	
	G. <u>STORAGE WITHIN THIS SPACE</u>			
	1. Built-in a. Shelving b. Parts bins c. Closets.			
	2. Bulk Storage a. Floor area b. Dimensions.			
	H. <u>SPECIAL BUILDING FEATURES</u>			
	1. Security a. Devices (safes, vaults) b. Hardware (locks, window bars, etc.) c. Wall construction.			
	2. Fire Protection a. Sensors (smoke, heat) b. Alarms c. Suppression systems.			
Y	3. Health & Safety a. Eye wash fountains b. Emergency showers c. <u>Nonslip surfaces.</u>	✓		NEW FLOOR COATING HAS REDUCED SLIPS AND FALLS.
Y	4. Material Handling a. <u>Lifts</u> b. Cranes c. Elevators d. Ramps or docks.		✓	A SMALL LIFT SHOULD BE PROVIDED IN BAYS 1 & 2 WHEN NEW ENGINE COURSE IS STARTED.
	5. Vibration a. Isolation.			
	6. Signage a. Identification signs.			
Y	I. <u>FURNITURE</u> 1. <u>Quantity and type</u> 2. Appearance/quality 3. Operating conditions or features.		✓	2 METAL TABLES SHOULD BE PROVIDED PER BAY FOR DEMONSTRATION.

Figure 4-5. Sample checklist for evaluating space quality—Continued

REQUEST NUMBER: 85-234

SUBMITTED BY: LTC. SMITH

DATE SUBMITTED: 5/12/85

SPACE MANAGEMENT REQUEST EVALUATION SUMMARY	
Topic	Comments
Is request complete?	YES
Is the space occupied different from assigned space?	YES, SOME ADMIN. SUPPORT SPACE HAS BEEN DIVERTED FOR SUPPLY STORAGE.
Are justification data valid?	NO, EXCESS SPACE REQUIREMENT UNJUSTIFIED
Is space of good quality for occupants? When evaluated?	YES, 4/15/85
Are administrative remedies or layout improvements possible?	USE VERTICAL SHELVING FOR STORAGE RATHER THAN OCCUPYING ADDITIONAL SQUARE FOOTAGE.
GENERAL NOTES	
	SUPPLY MATERIALS MAY BE BETTER ORGANIZED AND CATEGORIZED - RESULT: LESS SQUARE FOOTAGE TO STORE ITEMS.

Figure 4-6. Sample summary of an evaluation

SPACE MANAGEMENT		COMPARISON OF ALTERNATIVES		Sheet <u>1</u> of <u>1</u>	
Request # 8	Alternative #1 SPACE REASSIGNMENT - CONSTRUCT A NEW BUILDING XYZ -		Alternative #2 SPACE REASSIGNMENT - MOVE INTO 2 ND FLOOR OF BUILDING ABC -		
Requestor ABCD-EF	Description BUILDING XYZ - 1 STORY DESIGNED FOR ADMINISTRATIVE USE 10,000 GSF		Description BUILDING ABC - 3 STORY 1 ST FLOOR MAINTENANCE/WAREHOUSE SPACE 10,000 GSF 2 ND FLOOR ADMIN/SUPPLY SPACE 8,000 GSF 3 RD FLOOR ADMIN. SPACE 8,000 GSF		
POC/Phone					
Factor	Rating	Comment	Rating	Comment	
A. Effectiveness for use	8	PROVIDES WORK STATION SPACE OF 130 NSF/PERSON	6	SMALLER AMOUNT OF FLOOR AREA EACH PERSON ALLOTTED 110 NSF.	
B. Cost	4	COST OF CONSTRUCTION HIGH, BUT MAINTENANCE AND ENERGY COST LOWER	7	HIGH COST TO CONVERT TO USABLE AREA	
C. Schedule	9		4	SCHEDULING PROBLEMS EXIST WITH 1 ST & 3 RD FLOORS REGARDING SHARED AREAS	
D. Quality of space	10	EXCELLENT, BUILDING DESIGNED SPECIFICALLY FOR UNIT ABCD-EF	6		
E. Location	6	LOCATED AT THE CENTER OF THE BASE	8	LOCATED CLOSE TO ASSOCIATED ADMIN. CENTERS.	
F. Ripple effect	4		6	INTERFACE NEEDED WITH OTHER ORGANIZATIONS NOT IN BUILDING	
TOTAL SCORE	41	RANK 1	37	RANK 2	

Figure 4-7. Sample worksheet for evaluating alternatives

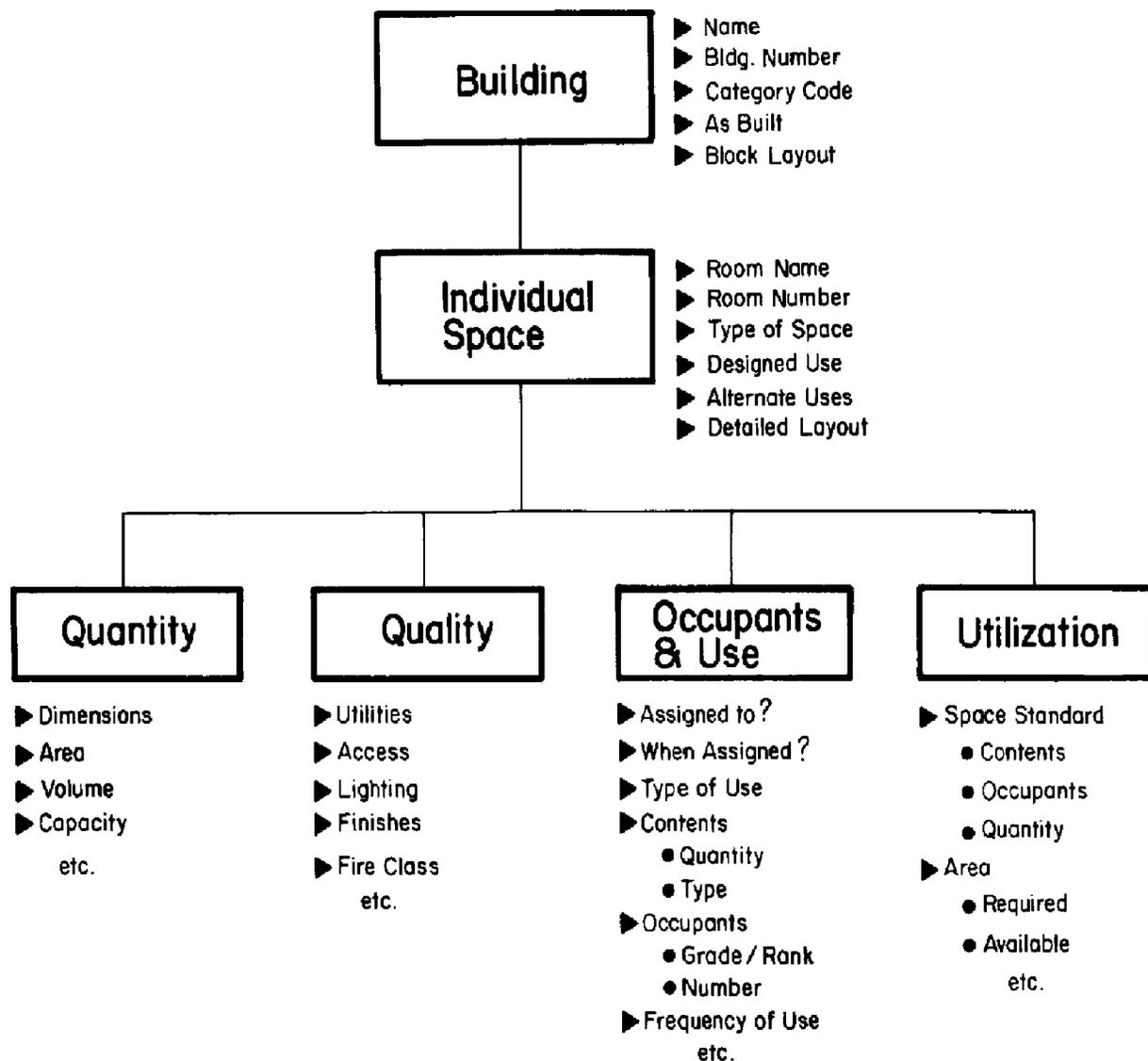


Figure 4-8. Summary of space management records

SPACE QUALITY QUESTIONNAIRE					
	strongly agree	agree	neutral	disagree	strongly disagree
OVERALL SATISFACTION					
1. I like working in this environment.		✓			
2. My workspace helps me to get my job done efficiently.		✓			
3. I am proud to show others my workspace.			✓		
LIGHTING					
4. The lighting in my workspace is good enough for the work I do.				✓	
5. I am bothered by reflections or glare on my office equipment.		✓			
6. I am bothered by reflections, shadows, or glare on written materials.			✓		
PRIVACY					
7. My workspace gives me enough privacy.				✓	
8. I can have a confidential conversation in my workspace.				✓	
9. I feel too exposed in this workspace.		✓			
10. While in my workspace I am too visible to passersby.	✓				
11. I can arrange my workspace to let people know I don't want to be bothered.		✓			
12. The activities of others do not interfere with my concentration.				✓	
NOISE					
13. I can concentrate on my work despite the level of background noise around me.			✓		
14. I can concentrate on my work despite interruptive and occasional noise (telephones, paging, etc.).				✓	

Figure 5-1. Sample questionnaire for collecting user opinions about space quality

SPACE QUALITY QUESTIONNAIRE	strongly agree	agree	neutral	disagree	strongly disagree
	LAYOUT				
15. I am satisfied with the layout of my workspace, all things considered.		✓			
16. The layout of my workspace is well suited to the work I do.		✓			
17. I would like to rearrange my workspace to increase my productivity.	✓				
18. My chair is comfortable for the kind of work I do.			✓		
COMMUNICATION					
19. Visitors and new employees often have difficulty finding their way around the office.		✓			
20. It's convenient for me to have a meeting with the persons with whom I communicate most often.			✓		
21. In my workspace I can comfortably meet with one or two other persons.		✓			
TEMPERATURE/VENTILATION					
22. My office temperature is comfortable when it is warm outside.				✓	
23. My office temperature is comfortable when it is cold outside.				✓	
24. My workspace has enough fresh air.			✓		
25. My workspace has drafts.	✓				

Figure 5-1. Sample questionnaire for collecting user opinions about space quality—Continued

Structural Capacity

1. Deadload: The structure must be able to support furniture, fixed equipment, new walls or other items added to the building.
2. Liveload: The structure must be able to support all people, moveable equipment (carts, vehicles) and impact loads.

Fire Safety

1. Egress Paths: Maximum allowable exit distances must not be exceeded for the new occupancy and layout.
2. Capacity of Exits: For the new occupancy the number and location of exit units must meet life safety codes.
3. Rating of Walls, Ceilings, and Floors: Building elements must meet ratings for the new occupancy. Finish materials must meet flame spread and smoke development requirements.
4. Fire Extinguishers: The number, capacity, type and location of extinguishers must meet standards for the new occupancy.
5. Fire Alarms, Sprinklers, and Other Suppression Equipment: For the new occupancy the capacity of fire hose, stand pipes and other components must be checked and meet standards. Fire alarms and sprinklers may be required for the new occupancy.

Heating, Ventilating, and Air Conditioning (HVAC)

1. Ventilation and Exhaust: New ventilation capacities may be needed for new occupancies. Exhaust systems may be needed for new equipment and activities that have fire and health hazards.
2. Heating: The heating system, including distribution and controls, may have to be redone because of new partitioning.
3. Air Conditioning: New equipment and increased occupancy may place demands on old equipment that cannot be met.

Security

1. Building: New uses may require changes on the site, in walls or partitioning to meet security requirements.
2. Locks: Deadbolts and keyed locksets may be needed to prevent theft and vandalism.

Plumbing

1. Sanitary Sewer: New occupancy may require changes in the location and capacity of sanitary lines.
2. Water: Hot and/or cold water may be needed in new locations.
3. Other systems: New uses may require compressed air lines, special gases (flammable, toxic or inert) or special waste systems.

Electrical

1. Power: Capacity, voltage and frequency changes may be needed to provide power where it is needed. Surge protection, RF shielding or special grounding may be required.
2. Lighting: Lighting systems may need to be changed to meet the needs of new activities and locations of occupants.

Communication

1. Telephone: New telephone systems, lines and locations for instruments may be required.
2. Computer Lines and Networks: Special computer communication lines or local area network lines may have to be installed or modified.
3. Educational Television, etc.: Lines for educational television, satellite receivers, and other special communication equipment may need to be installed.

Figure 5-2. Sample technical checklist for evaluating a space for alternative uses

Space

1. Amount: Is there enough space for the new function?
2. Dimensions: Are dimensions of rooms appropriate for the new activities? Will changes in partitions be needed? Is the ceiling the right height? Are doors wide enough?
3. Shape: Is a particular room shape needed for a new function?
4. Clear Span: Is the minimum distance between support columns large enough for new equipment and activities?

Access/Circulation

1. Movement: Can people and equipment get into and out of a space conveniently? Can they move around in the space easily?
2. Visual Access: Do people need to see in or out? Should visual access be cut off?
3. Distance to Other Spaces: Are horizontal and vertical distances excessive for walking, cable runs, etc.?
4. Functional Relationship: Can groups or individuals who have to work together be located adjacent to or nearby one another? Is there reasonable access to outside doors, loading docks or special facilities in the building for people, vehicles and equipment?

Environmental Conditions

1. Sound Control: Are noisy activities grouped together? Are they isolated from quiet activities? Are acoustical control features provided?
2. Lighting: Is general lighting and task lighting located properly? Is the right amount of illumination provided? Is lighting quality and contrast adequate?

Appearance/Finishes/Image

1. Floors: Do floors have the right characteristics, such as slip resistance, static free, good drainage for wet operations, easily cleaned, acid resistant, water resistant, etc.?
2. Walls: Do walls have the right features, such as good appearance, easily cleaned, mar resistant, capable of attaching maps and charts, etc.?
3. Ceiling: Are ceiling finishes suitable?

Communication

1. Speech: Is communication among workers fostered? Is sound control adequate?
2. Systems: Are necessary communication systems provided, such as telephone, microphone or speaker systems, computer networks, etc.?

Special Features

1. Health and Safety: Are special safety devices provided, such as eye wash fountains, emergency showers, barrier guards, etc.?
2. Material Handling Systems: Are material handling features provided, such as hoists, cranes, ramps, etc.?
3. Features for the Physically Handicapped: Are provisions necessary for the physically handicapped? Are they available?
4. Toilet Facilities: Are toilets sized adequately for a new building population? Are there enough water fountains? Are employee shower facilities required? Are locker rooms or clothing change rooms needed?

Figure 5-3. Sample functional checklist for evaluating a space for alternative uses

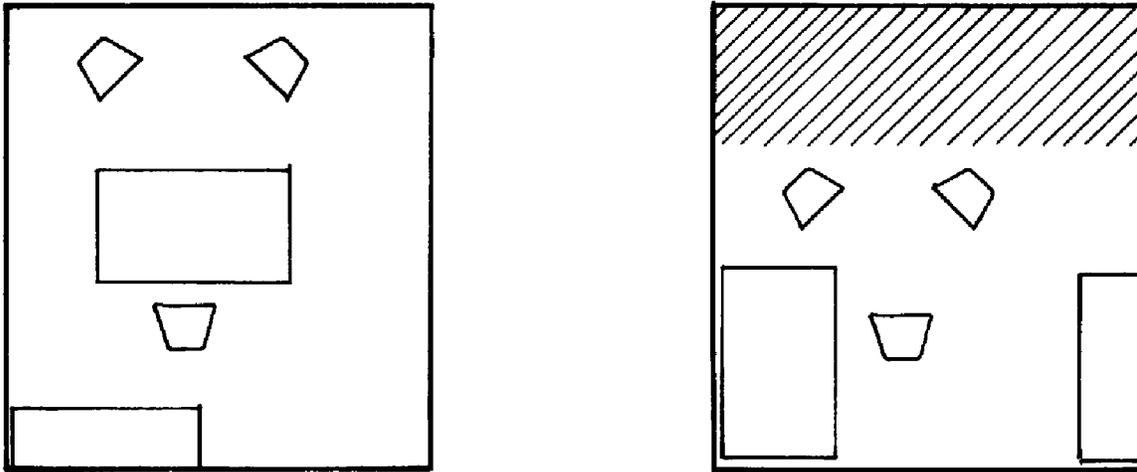


Figure 9-1. Turning a desk toward a wall can save space

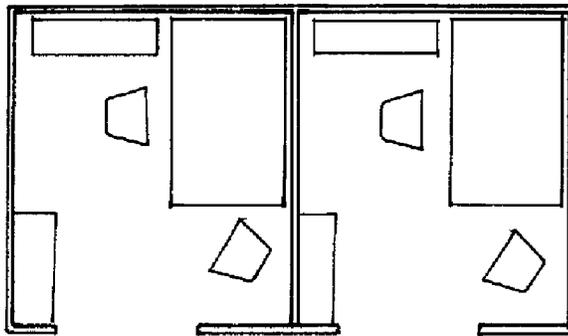


Figure 9-2. Conventional furniture workstations with movable partitions

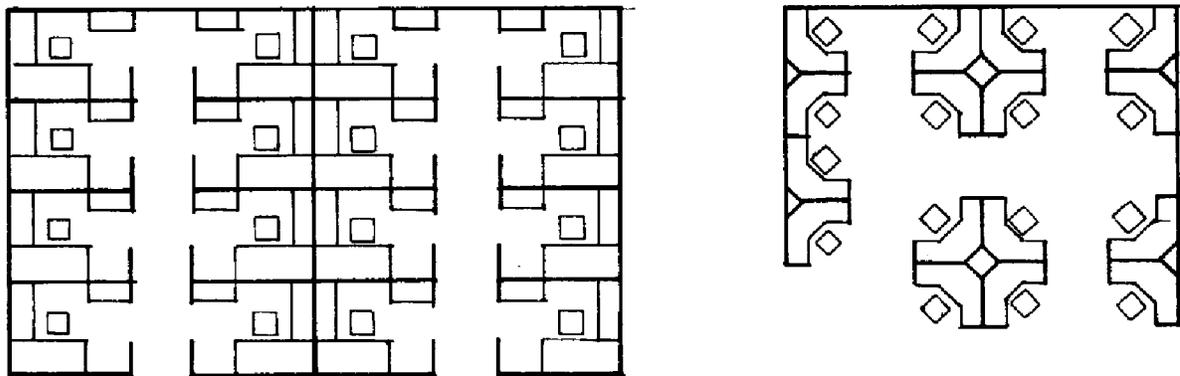


Figure 9-3. Comparison of two layouts for regimented workstations

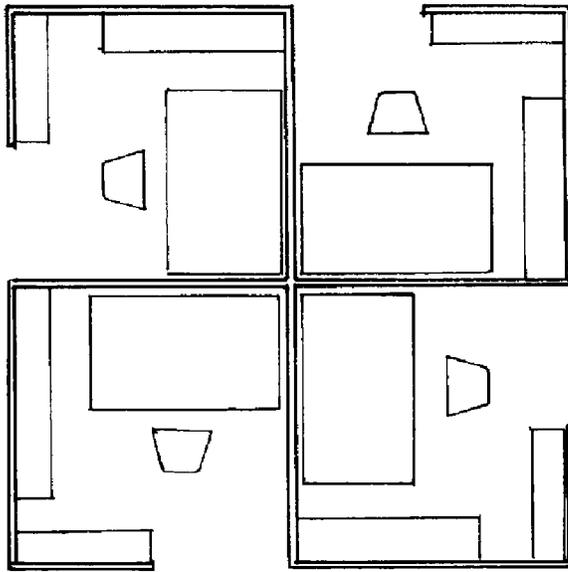


Figure 9-4. Workstation clusters with conventional furniture

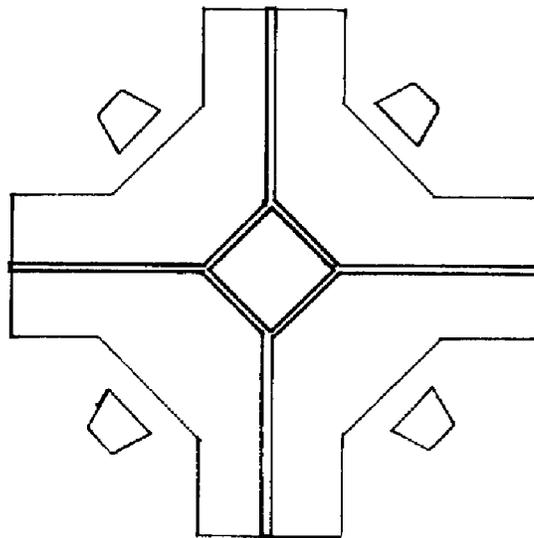


Figure 9-5. Workstation clusters with modular furniture

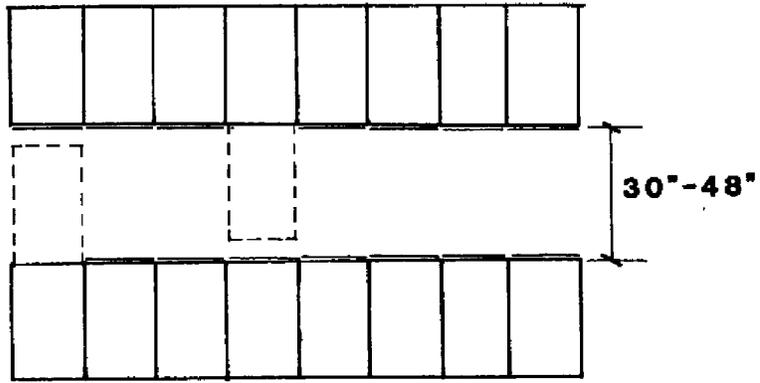


Figure 9-6. Shared access for facing file cabinets helps save space

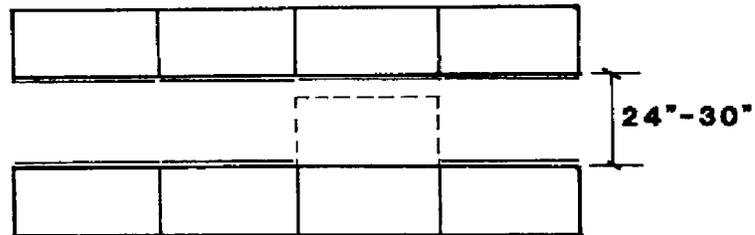


Figure 9-7. Lateral files reduce access space

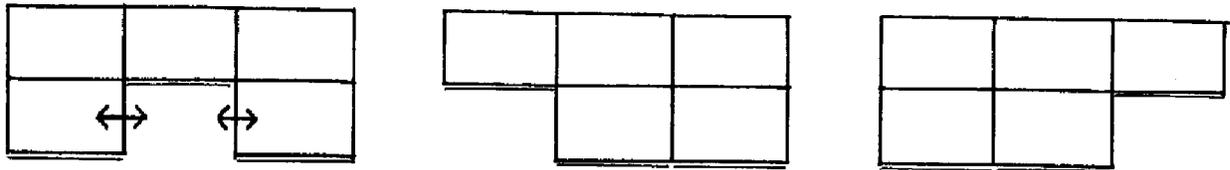


Figure 9-8. Lateral files stacked two deep

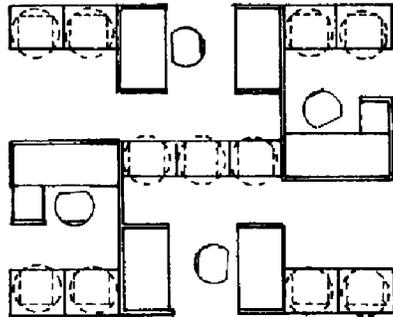
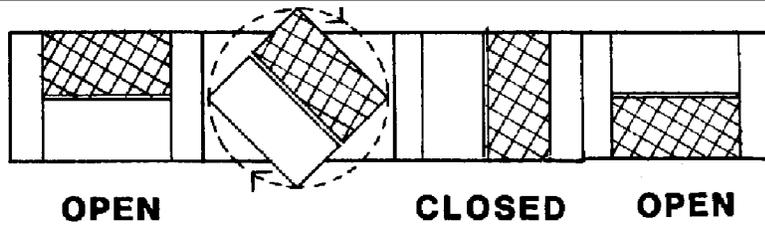


Figure 9-9. Example of lateral files that rotate

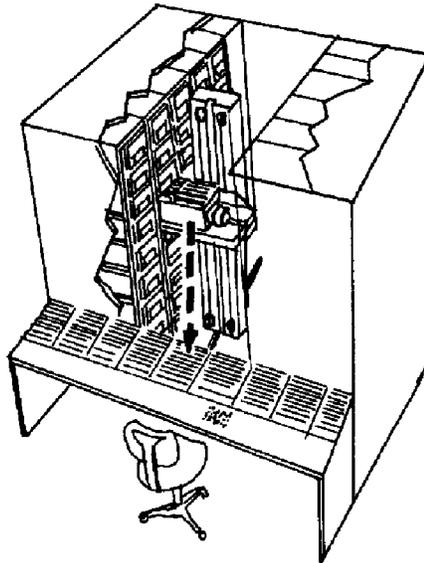


Figure 9-10. Ferris wheel style lateral file unit

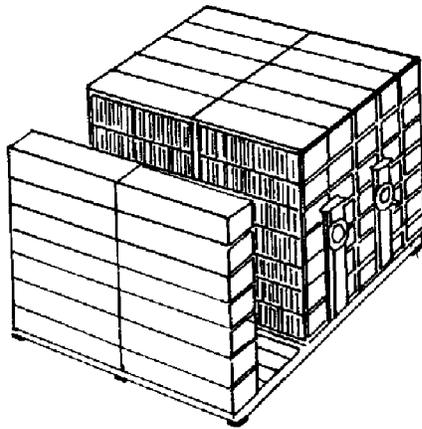


Figure 9-11. Movable aisle file units

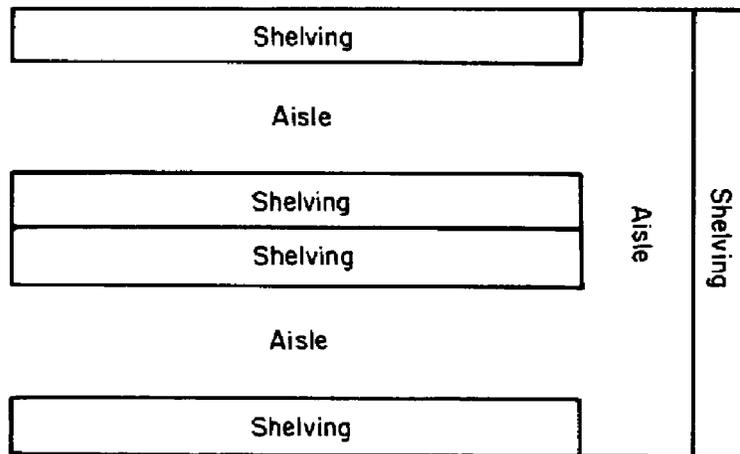


Figure 10-1. Placement of shelves can improve space utilization

Installation Name: West Point Military Reservation

Date Prepared: 10 Jan 85

Installation Number: 36993

User: AKA-012 AKO

Relation Code: 36993

Army Location Code: 36903

User Code	Facility Number-Suffix	Type Const.	Category Code	Category Description	Current Use Category Code	Usable Floor Area
AA	PC0600 DC	P	61011	DPC OFCS BB61	61011	1220
AA	PC0600 SA	P	61011	SASPP OFC BB61	61011	758
AA	PC0600 SU	P	61011	SUPT OFCS BB61	61011	<u>2767</u>
						<u>4745</u>
AC	PC0001 U	P	74090	UNION OFF BB61	71114	
AC	PC0600 CS	P	61011	CH OF STAFFBB61	61011	460
AC	PC0600 GS	P	61011	SGS OFCS BB61	61011	583
AC	PC0600 PO	P	61011	PROTOCOL OFBB61	61011	<u>511</u>
						<u>1554</u>

Figure B-1. Example space utilization report by user

<u>Budgeted</u>	<u>Actual</u>	<u>Excess/ Deficiency</u>		<u>Categories/Projects</u>
620	721.5	102CR	.....	Branch Supervision
75	58.0	17	.....	Division Supervision
30	23.5	7	.....	Counsel Employees
40	81.5	47CR	.....	Performance Rating
400	1325.0	926CR	.....	Space Utilization
200	423.0	223CR	.....	BMAR Studied & Analy
1100	1465.0	365CR	.....	IFS Report Analysis
300	258.0	48	.....	Develop Ann Work Ana
200	610.0	410CR	.....	Prepare Reports
300	377.0	77CR	.....	Prepare Ann SON/IJR
40	45.0	5CR	.....	CA-Prepare Invent
150	75.0	75	.....	CA-DFV Cost Eff Org
5000	410.0	4590	.....	CA-SEW
40	.0	40	.....	CA-FXCEP Justificat
40	12.0	28	.....	CA-Bid Cost Comp
10	2.0	8	.....	CA-Steering Comm
200	1009.5	810CR	.....	Methods Procd Stud
50	168.0	118CR	.....	Time Study & Work SAM
10	.0	10	.....	EPS MRD Studies
800	737.0	63	.....	IFS Projects
150	44.0	106	.....	Train Other Branches

Figure B-2. Example master schedule report

PROJECTED SPACE NEEDS

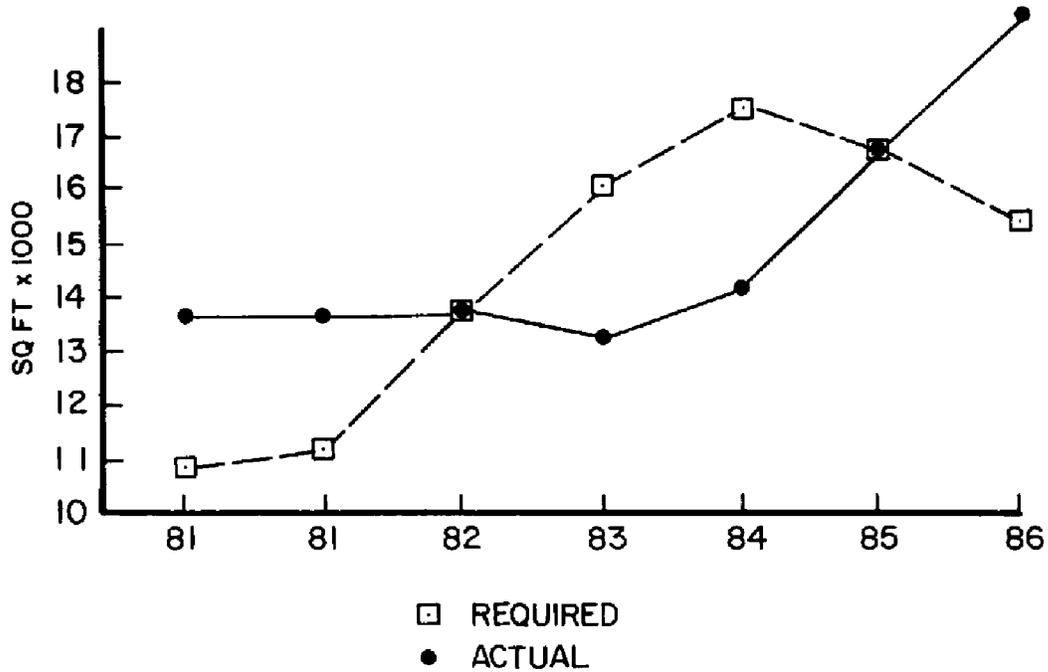


Figure B-3. Space required versus space actually available

Office Space Quality

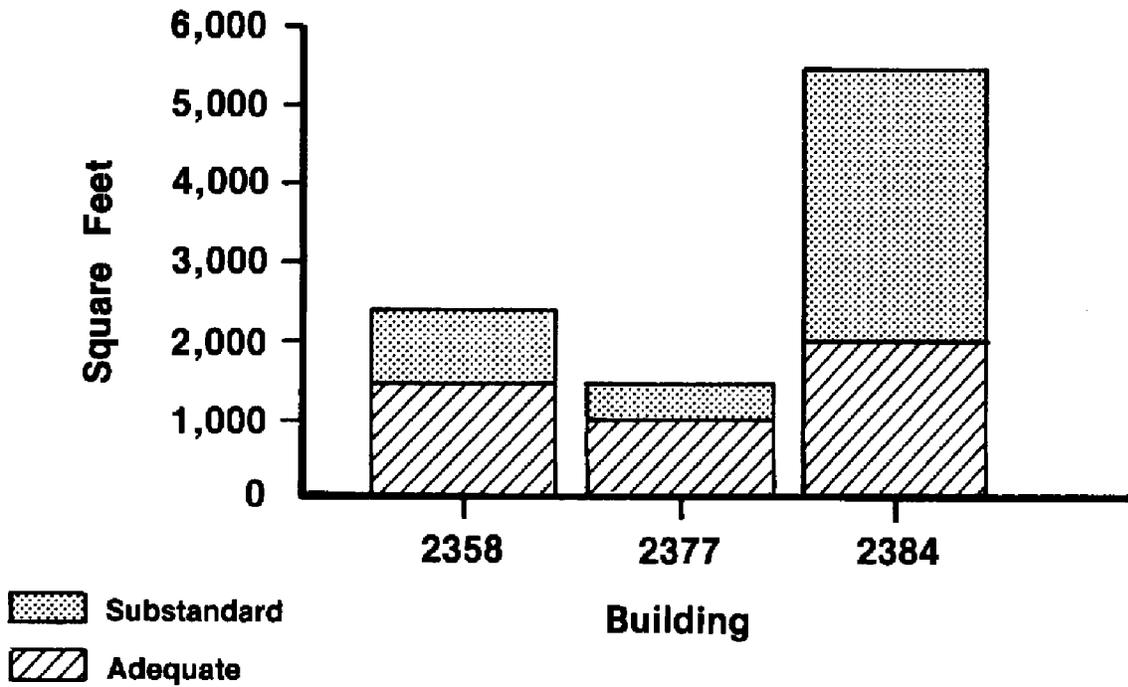
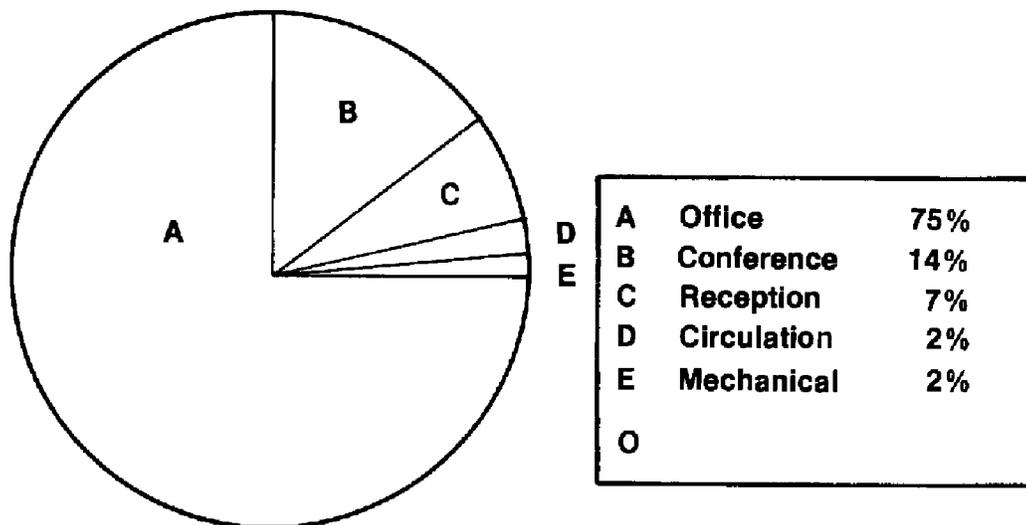


Figure B-4. Office space quality

<u>Unit</u>	E1-E4 (3 Per Room)		E5-E6 (2 Per Room)		E8-E9 (1 Per Room)	
	<u>Auth</u>	<u>Reqd</u>	<u>Auth</u>	<u>Reqd</u>	<u>Auth</u>	<u>Reqd</u>
A CO	15	18	8	9	1	2
C CO	17	17	7	8	1	1
First/Fifth	20	19	9	10	2	2
AIR CAV	27	34	13	16	3	4
Total Space	79	88	37	43	7	9

Figure B-5. Example barracks space analysis



Space Analysis for Building 1257

Figure B-6. Space analysis for a given building

01-Aug-85 To 31-Aug-85

<u>Bldg</u>	<u>Location ID</u>	<u>Type</u>	<u>Hours</u>			<u>Capacity</u>		
			<u>Avail</u>	<u>Sched</u>	<u>Percent</u>	<u>Avail</u>	<u>Sched</u>	<u>Percent</u>
SN	15	A	184.0	77.3	42.0	9200	2164	23.5
SUH	19 LIBRARY	A	184.0	96.2	52.3	9200	673	7.3
SUH	64 LIBRARY	A	184.0	102.7	55.3	9200	2876	31.2
NONE	POLO FIELD	DA	184.0	60.0	32.6	7360	420	5.7
SUH	25	E	184.0	197.6	107.4	7360	5532	75.1
T101	STORAGE	EQ	184.0	0.0	0.0	N/A		
831	TNG AREA	FL	184.0	0.0	0.0	5520	0	0.0
SUH	23	LH	184.0	10.0	5.4	22080	280	1.3

Figure B-7. Example location utilization report for department ABC

Glossary

Section I Abbreviations

ACTS

Army Criteria Tracking System

ADP

automated data processing

AG

auditor General

AIMS

Automated Instructional Management System

AMO

automation management office

ASIRS

Automated Storage and Retrieval System

DA

Department of the Army

DEH

Directorate of Engineering and Housing

DF

Disposition Form

DG

Design Guide

DIO

Director of Industrial Operations

DOD

Department of Defense

DPCA

Directorate of Personnel and Community Affairs

DPT

Directorate of Personnel and Training

DRIS

Defense Regional Interservice Support

GOCO

Government-owned, contractor-operated

GSA

General Services Administration

HQDA

Headquarters, Department of the Army

HVAC

heating, ventilating, and air-conditioning

IFS

integrated Facilities System

MACOM

major Army Command

O&M

operations and maintenance

PAX

Private Automatic Exchange

POC

point of contact

USAR

U.S. Army Reserve

VDT

video display terminal

Section II**Terms**

This section contains no entries.

Section III**Special Abbreviations and Terms**

There are no special terms.

UNCLASSIFIED

PIN 060961-000