# UNIFIED FACILITIES CRITERIA (UFC)

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# LIBRARIES

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# UNIFIED FACILITIES CRITERIA (UFC)

## LIBRARIES

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U.S. ARMY CORPS OF ENGINEERS

NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND

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**This UFC supersedes UFC 4-740-20, *Libraries*, dated 1 May 2006.**

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## FOREWORD

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

UFC are living documents and will be periodically reviewed, updated, and made available to users as part of the Military Department's responsibility for providing technical criteria for military construction.  Headquarters, U.S. Army Corps of Engineers (HQUSACE), Naval Facilities Engineering Systems Command (NAVFAC), and Air Force Civil Engineer Center (AFCEC) are responsible for administration of the UFC system.  Technical content of UFC is the responsibility of the cognizant DoD working group.  Defense Agencies should contact the respective DoD Working Group for document interpretation and improvements.  Recommended changes with supporting rationale may be sent to the respective DoD working group by submitting a Criteria Change Request (CCR) via the Internet site listed below.

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

- Whole Building Design Guide website https://www.wbdg.org/ffc/dod.

Refer to UFC 1-200-01, *DoD Building Code*, for implementation of new issuances on projects.
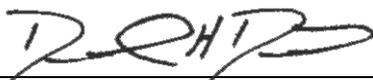
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# CHAPTER 1 INTRODUCTION

## 1-1    REISSUES AND CANCELS.

This UFC reissues and cancels UFC 4-740-20, *Libraries*, dated 1 May 2006.

## 1-2    PURPOSE AND SCOPE.

This UFC provides guidelines for evaluating, planning, programming, and designing libraries. Guidance is provided for developing library facilities appropriate for each installation to combine with operations and population requirements.

This information must be used by architects/engineers (A/E), designers, base civil engineers (BCE), library directors, command and headquarters' review personnel, and others involved in developing and approving library construction projects. It is intended to help all participants better understand contemporary library requirements, programs, and design criteria so they can effectively participate in the project development process.

For Navy libraries located within Historic Resource Facilities (HRF), refer to FC 4-760-10N, *Navy Museums and Historic Resource Facilities*, for additional requirements.

### 1-2.1    Libraries Mission Statement.

The mission statement for library facilities at DoD installations is to provide professional library programs and services to meet the military mission, educational, and leisure-time needs of the base community, including active-duty personnel (including all U.S. and foreign military), families, retirees, civilian employees, and other authorized users. The mission objectives for DoD libraries include the following three priorities, ranked by order of importance:

1.    Mission support

2.    Educational support

3.    Quality of life support

### 1-2.1.1    Mission Support.

Installation mission support is the primary priority of each DoD library facility. The support functions provided are determined by the library director at each installation and may include the identification, organization, and procurement of technical reference services and publications for official use. Funding for DoD library facilities helps develop the services, programs, materials, and personnel needed to provide support for installation-specific mission requirements.

### 1-2.1.2    Educational Support.

Support for Professional Military Education (PME) and Voluntary Education Programs (VEP) for active-duty military personnel and authorized civilian contractors is the second priority for library facilities, programs, and services at installations around the world.

**1-2.1.3        Quality-of-Life Support.**

General library facilities, programs, and services help improve the quality of life for active-duty personnel, their families, retirees, and other authorized customers. The placement, siting, and possibly colocating of a library facility with other quality of life amenities can create destinations and a sense of community. The planned creation of destinations with many amenities or attractions for the installation community to come together is a quality-of-life force multiplier. This quality-of-life support is an important function of most facilities; however, installation mission support is always the first priority.

**1-2.2        Types of Libraries.**

The planned users, collections/content, and mission of the installation population determine the functional type of library. The facility and criteria used to develop a library should reflect the assigned type. The Air Force identifies base library types in AFMAN 32-1084, *Standard Facility Requirements*, CC 740675 Base Libraries 7416. Requirements and design criteria for academic, technical/scientific, medical, and specialty libraries are not included in this UFC.

- General libraries ("branch" or "public" type library)
- Academic libraries
- Medical libraries
- Technical/scientific libraries
- Specialty libraries (including legal)

**1-2.2.1        General Libraries.**

General libraries are centralized facilities that serve the whole installation and its entire population. These facilities offer information, materials, collections, and services similar to general public libraries found in most communities and schools. Design criteria for different types, configurations, and sizes of DoD general library facilities are the focus of this UFC.

**1-2.2.2        Academic Libraries.**

Academic libraries are an integral part of a formal school or college-level educational institution. These libraries are often used by students as a quiet place for studying and research and for collaborative work with other students.

**1-2.2.3        Medical Libraries.**

These libraries are located within medical facilities and feature specific medical collections.

### 1-2.2.4 Technical/Scientific Libraries.

Technical or scientific libraries provide detailed information and reference materials for personnel who work in research, development, testing and evaluation (RDT&E) programs or support other scientific and technical functions.

### 1-2.2.5 Specialty Libraries.

### 1-2.2.5.1 Legal Libraries.

Legal libraries are integral to the practice and college-level education of law. These libraries are often used by students and practitioners of law as a quiet place for studying and research and for collaborative work with others.

### 1-2.2.5.2 Site Libraries.

Site libraries contain a collection of print and non-print materials issued to a remote location at the request of the local installation or services commander to enhance library services. They may or may not have paid staff and set operating hours. Site libraries operate under the administration of the local site commander and are serviced from a general library or library service center.

### 1-2.2.5.3 Field Libraries.

Field libraries (Air Force-specific) house a collection of general reading materials issued from and directed by a general library or library service center to an Air Force, DoD, or State Department activity for which the Air Force has responsibility (see DoDI 1015.10, *Military Morale, Welfare, and Recreation (MWR) Programs*, Enclosure 10). Field libraries may or may not have set operating hours or paid staff and may operate on the honor system.

### 1-2.2.5.4 Forward and Expeditionary Libraries.

Materials and resources for contingency operations, including pre-departure needs, and support to remote sites, collections of paperback books, newspapers, periodicals, and audio/visual (A/V) materials may be issued to library-inaccessible locations serviced from a command/headquarters or general library.

### 1-2.3 Library Systems and Relationships.

Library design and construction projects may be the first library facility at an installation or one of a number of networked and cooperative facilities with different roles in achieving the library's mission at DoD installations.

### 1-2.3.1 General Libraries.

General libraries serve the installation community in a manner comparable to public libraries that serve a civilian community. General libraries coordinate their services to support the mission and education of installation personnel, including those served by other types, such as technical or academic. Considerations for force-multiplying the

quality of life or creation of community space must be included in planning these general library facilities.

### 1-2.3.2 Accessory Libraries.

Accessory libraries feature academic, technical, scientific, or medical content and specialized programs to serve the unique educational program curriculum needed to support mission requirements at each installation, and often a specific building and mission. Often these libraries will be located inside another building. Coordinate with the host building to maximize the efficiency of space and facility resources. Spaces such as restrooms, elevators, stairs, and conference rooms could potentially be shared with the host building but this will be installation-specific.

### 1-2.3.3 Extension Libraries.

Extension libraries feature general and public interest content but consist of a reduced program to serve as mobile, temporary, or specific population or educational opportunity to support the quality of life or readiness of each installation. Extension libraries may or may not have a dedicated building, space, or may be a mobile site, such as a bookmobile.

### 1-2.4 Library Users.

Generally, library users include active-duty personnel, their families, retirees, and other authorized customers. Base/installation engineers, library directors, major command, or headquarters should provide the designers with anticipated population, demographics, common commitments and missions of users, and other desired usages of the library facilities. In designated locations, the library may be used by the surrounding community.

### 1-3 APPLICABILITY.

This UFC applies to all Service elements and contractors involved in the planning, design, and construction of general libraries worldwide. Other library types and renovation/additions will adopt portions of the guidance applicable to the scope and intent of their project.

### 1-4 GENERAL BUILDING REQUIREMENTS.

Comply with UFC 1-200-01, *DoD Building Code*. UFC 1-200-01 provides applicability of model building codes and government-unique criteria for typical design disciplines and building systems, as well as for accessibility, antiterrorism, security, high-performance and sustainability requirements, and safety. Use this UFC in addition to UFC 1-200-01 and government criteria referenced therein.

### 1-5 CYBERSECURITY.

All facility-related control systems (including systems separate from a utility monitoring and control system) must be planned, designed, acquired, executed, and maintained in

accordance with UFC 4-010-06, *Cybersecurity of Facility-Related Control Systems*, and as required by individual Service implementation Policy.

## 1-6 GLOSSARY.

Appendix B contains acronyms, abbreviations, and terms.

## 1-7 REFERENCES.

Appendix C contains a list of references used in this document. The publication date of the code or standard is not normally included in this document. Unless otherwise specified, the most recent edition of the referenced publication applies.

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## CHAPTER 2 PROGRAMMING AND PREDESIGN

2-1        **GENERAL.**

This chapter presents criteria specifically applicable to the design of each functional area and space of library facilities. Primary design considerations are presented for each functional area, indicating the anticipated use, performance, organization, character, and relationships between each area's component spaces. Example criteria are provided for space sizes, storage requirements, furnishings, equipment, and technical requirements for each component space within each functional area. The technical requirements and special criteria provided in this chapter address only items in addition to standard requirements by code, UFC references, and professional or construction service contracts. General considerations are presented in Chapter 3.

The guidelines in this chapter apply to all sizes and types of library facilities. Specific guidance for space allocation, in the three prototypical sizes of general libraries, is presented in Table 2-1. All guidance is provided based on the recommended space sizes and capacities for each overall facility size, supplemented by standard use and size factors, as appropriate. These recommendations may be modified in the design of an individual project to reflect local program requirements and capacity needs.

### 2-1.1        Program Definition.

The Requirements Document defines the program for design of an individual project, including functional requirements and design criteria. This includes the space programming and facility or project area/size. The programs found in this chapter are only guidance and example programs, plus descriptions of typical measures for the site design, building design, and building system concepts in Chapter 3. In addition, any unique local requirements concerning building programs, design criteria, and technical systems should be included in the Requirements Document.

**Table 2-1   General Library Space Allocation**

| Functional Area/Space | # | Small | # | Med. | # | Large |
|---|---|---|---|---|---|---|
| **Public Service Areas** | | | | | | |
| Display And Bulletin Boards | 1 | 100 | 1 | 240 | 1 | 320 |
| Circulation Area (w/Circulation Desk) | 1 | 300 | 1 | 350 | 1 | 420 |
| OPACS/ILS | 1 | 90 | 1 | 120 | 1 | 240 |
| Technology Hub | 1 | 12 | 1 | 20 | 1 | 28 |
| Reading Areas | 15 | 600 | 22 | 880 | 15 | 1,800 |
| General Collections | 1 | 1,200 | 1 | 3,200 | 1 | 7,200 |
| Reference Collections | 1 | 200 | 1 | 400 | 1 | 700 |
| Special Collections | 1 | 75 | 1 | 200 | 2 | 320 |
| Audio and Video Collections | 1 | 50 | 1 | 75 | 1 | 100 |
| Digital Media | 1 | 50 | 1 | 75 | 1 | 100 |
| Study/Huddle Rooms | 6 | 240 | 12 | 480 | 18 | 720 |

| Functional Area/Space | # | Small | # | Med. | # | Large |
|---|---|---|---|---|---|---|
| Teen Area (Reading) | 1 | 180 | 1 | 600 | 1 | 900 |
| Teen Area (Holdings/Collections) | 1 | 60 | 1 | 160 | 1 | 400 |
| Photocopier/Fax/Scan | 1 | 80 | 1 | 160 | 1 | 240 |
| Newspaper/Paperback Racks | 1 | 40 | 1 | 80 | 1 | 120 |
| Outdoor Reading Terrace | | n/a | | n/a | | n/a |
| **Information Services** | | | | | | |
| Customer Computer Lab | 1 | 450 | 1 | 1,250 | 1 | 2,400 |
| Printers/Stands/Projection Equipment | 1 | 50 | 1 | 160 | 1 | 320 |
| Storage | 1 | 40 | 1 | 80 | 1 | 180 |
| Community Technology | 1 | 120 | 1 | 240 | 1 | 450 |
| **Meeting Space** | | | | | | |
| Group Meeting, Conference | 1 | 200 | 1 | 200 | 2 | 400 |
| Group Meeting, Classroom | 1 | 1,000 | 1 | 1,200 | 1 | 2,000 |
| Group Meeting, Small | 2 | 180 | 4 | 340 | 5 | 500 |
| Coffee/Café | 1 | 160 | 1 | 500 | 1 | 1,000 |
| Storage Closet | 2 | 40 | 2 | 80 | 2 | 120 |
| **Children's Areas** | | | | | | |
| Children's General Collection | 1 | 150 | 1 | 400 | 1 | 800 |
| Children's Special Collection | 1 | 20 | 1 | 80 | 1 | 120 |
| A/V Collections | 1 | 40 | 1 | 80 | 1 | 120 |
| Children's Story Alcove & Activities | 1 | 150 | 1 | 200 | 1 | 400 |
| Storage | 2 | 40 | 2 | 105 | 2 | 175 |
| **Administration Areas** | | | | | | |
| Office (1x, Director) | 1 | 125 | 1 | 125 | 1 | 125 |
| Office (2x, Assistant IT) | 2 | 200 | 2 | 200 | 2 | 200 |
| IT Workroom/Server Room | 1 | 125 | 1 | 125 | 1 | 125 |
| General/Open Office | 3 | 160 | 6 | 300 | 8 | 400 |
| Breakroom | 1 | 125 | 1 | 125 | 1 | 150 |
| Storage | 1 | 36 | 1 | 112 | 1 | 200 |
| Conference Room (May be combined with Staff Break Room) | 1 | 160 | 1 | 200 | 1 | 240 |
| Staff Restroom | 1 | 50 | 1 | 50 | 1 | 100 |
| Staff Lockers | 1 | 24 | 1 | 64 | 1 | 80 |
| Shower Facilities | 1 | 16 | 1 | 16 | 1 | 32 |
| **Technical Service Areas** | | | | | | |
| Staff Conference/Meeting Room | 1 | 120 | 1 | 160 | 2 | 280 |
| Loading Dock | 1 | 80 | 1 | 80 | 1 | 100 |
| Workroom (staff) | 1 | 200 | 1 | 400 | 1 | 600 |

| Functional Area/Space | # | Small | # | Med. | # | Large |
|---|---|---|---|---|---|---|
| Storage for Material Processing | 1 | 200 | 1 | 300 | 1 | 400 |
| Storage for Supplies (Bulk, Technical) | 1 | 40 | 1 | 60 | 1 | 80 |
| Storage for Supplies (Technology And Programs) | 1 | 20 | 1 | 30 | 1 | 40 |
| Storage (DRMO) and Seasonal | 1 | 20 | 1 | 30 | 1 | 50 |
| **Support Areas, Facility/Utility:** | | | | | | |
| Mechanical Room | 1 | 500 | 1 | 800 | 1 | 1,000 |
| Pump Room (Fire/Water) | 1 | 64 | 1 | 80 | 1 | 100 |
| Electrical Room | 1 | 100 | 1 | 160 | 2 | 240 |
| Lobby/Waiting Room | 1 | 200 | 1 | 400 | 1 | 600 |
| Vestibule | 1 | 80 | 1 | 100 | 1 | 120 |
| Janitor Closet | 1 | 64 | 1 | 80 | 2 | 160 |
| Public Toilet | 2 | 500 | 3 | 600 | 5 | 720 |
| Vending | 1 | 18 | 1 | 36 | 2 | 48 |
| Shower Facilities | 2 | 32 | 2 | 32 | 5 | 72 |
| Water Fountain (Bottle-Filling) | 1 | 20 | 1 | 20 | 1 | 40 |
| Elevator | 0 | - | 0 | 128 | 0 | 320 |
| **TOTAL PROGRAM AREA** | | 9,196 | | 16,768 | | 29,215 |

## 2-2    SPACE ALLOWANCES CRITERIA.

The recommended set of functional areas and spaces for different sizes of general library facilities are shown in Table 2-1. This table provides example space size programs for representative facilities in each of three library program size categories. These are not definitive space programs but guides to approximate space sizes recommended for the given size facility. For facility sizes not included in this table, proportionally adjust the program figures shown for the specific facility's intended population and services. In developing the space program for an individual facility, consider the issues of overall building design and relationships described in this UFC.

Each base may determine that different or additional requirements are relevant to its local program. These considerations may affect the functional areas and spaces included in the program and their relative sizes.

### 2-2.1    Multiple Library Facilities

When the base population is separated by geographic or transportation barriers, planning should consider providing multiple facilities sized individually for the geographic populations. This is particularly important for equal accessibility to the library. Community destinations are a key issue for quality of life.

In these cases, each facility should be size-classified for the population to be served and the functions to be provided. Efficiencies may be gained by consolidating

management and administrative functions for a particular area or command with multiple libraries into a library services center.

## 2-3 CORE FUNCTIONAL AREAS.

General libraries have six specific core functional areas plus non-assignable support areas, with local variations in the scope of operation under each category. These functional area categories include the following:

- Public services areas
- Information services areas
- Meeting space areas
- Children's areas
- Administration areas
- Technical services areas
- Support areas (including mechanical rooms)

See paragraph 2-8 for additional information.

## 2-4 FACILITY REQUIREMENTS.

In developing the space program for an individual facility, consider the issues of overall building design and relationships discussed in Chapter 3 and Chapter 4. The space allocation sizes provided are not definitive space programs but guides to approximate space sizes recommended for the given size facility. Space requirements for library extension services (LES) facilities are based on local conditions and identified requirements of the community served.

In addition to the space program for each facility, consider the need or potential for consolidating the library into a shared facility with a BEC or learning center. It may be beneficial for some functional areas, like computer labs, to be shared with the BEC. Management, supervision, and maintenance responsibilities may also need to be evaluated along with the facility requirements.

## 2-5 CONSIDERATIONS FOR LIBRARY DESIGN.

### 2-5.1 Productivity.

Technological advances, demographic shifts, and continual demands for innovation have created pressures for environments to support the changing nature of work and workplaces. The various functions, programs, and customers in a library lead to designs to provide adaptability that enables spaces to change with work groups, activities, and projects.

The current understanding of learning spaces for mental focus and performance should be considered with other design objectives and within a total project context in order to

achieve quality study and collaboration spaces. Also, library quiet spaces are intended to include mental focus and productivity strategies that are often co-supportive with sustainable design principles, functional programming, and functionality. Endeavour to find a balance for the longevity and durability of the facility with all the issues considered. The WBDG Design Objectives website (https://www.wbdg.org/design-objectives/productive) provides five fundamental principles of productive building designs.

### 2-5.1.1 Promote Health and Well-Being.

Indoor environments strongly affect human health. An effective environment should be designed to support and enhance the health and well-being of its occupants. Sustainable design principles also help achieve this objective and the facility's quality of life mission.

### 2-5.1.2 Provide Comfortable Environments.

An environment designed and operated to provide the highest achievable levels of visual, acoustic, ergonomic, and thermal comforts for its occupants underpins worker effectiveness. Consider documenting predicted thermal comfort as described in ASHRAE 55, *Thermal Environmental Conditions for Human Occupancy*.

### 2-5.1.3 Design for the Changing Workplace.

Provide spaces with flexibility, social support, and technology to promote new ways of working, learning, and engaging in a number of activities.

### 2-5.1.4 Integrate Technological Tools.

Effectively integrate technological tools and distribution networks required in today's environments to enable occupants to perform activities or their duties, starting first and foremost with properly designed pathways and spaces.

### 2-5.1.5 Assure Reliable Systems and Spaces.

Reliability is one of the greatest concerns for building occupants since it directly affects their safety, health, and comfort. Occupants must be able to rely on sufficient functional space, building systems, equipment, and tools that function consistently and are properly maintained.

### 2-5.2 Energy and Resource Efficiency.

The mission of DoD and other federal agencies includes the protection and preservation of America's natural resources. Designs optimized for conservation of energy and other resources will contribute to achieving these missions and help to minimize environmental and air-quality pollution. Refer to UFC 1-200-02 for more information.

**2-5.3        Resiliency, Operations, or Natural Disaster Response.**

Building resiliency is the capacity of a building to continue to function and operate under extreme conditions, such as (but not limited to) extreme temperatures, sea level rise, natural disasters, etc. The base may provide a risk or vulnerability assessment applicable to the project site. As the built environment faces the impending effects of global climate change, building owners, designers, and builders can design facilities to optimize building resiliency. If desired by the installation or community, review UFC 4-023-10, *Safe Havens*, for measures or improvements.

**2-5.4        Adaptability with Modular Furniture.**

Building or space adaptability is the capacity to accommodate diverse uses of the occupancy or program. Modular furniture can be used to accommodate the events and function in the library's public service space or children's space. It may also be arranged for individuals for informal uses. It should be comfortable yet durable, with multiple configuration options. Provide an anchor or bracket to secure bookshelves.

**2-5.5        Security.**

The public entrance/exit is a prominent architectural component to facilitate customer wayfinding. Its design and detailing must follow UFC 4-022-01, *Security Engineering: Entry Control Facilities / Access Control Points*, and UFC 4-026-01, *Design to Resist Forced Entry*, where access control or denial is appropriate. Provide RFID scanners in the entry lobby to protect against theft. A separate "staff only" entrance may be provided that is not in a prominent location but near dedicated staff parking areas. Other exits must be for emergency use only and alarmed.

Staff at the circulation desk, or alternatively a staff work station, should have visual control over most of the reading areas for adults and children, the entry lobby, and entries to the activity areas, restrooms, and outdoor reading terrace. The circulation desk should not dominate the feeling of the library. Staff at the circulation desk or in the work room should be able to monitor equipment and activities in the computer, A/V, and technology areas. If utilized, outdoor reading terraces must be accessible only from inside. Provide curved-face surveillance mirrors or closed-circuit television (CCTV) for all hidden areas (e.g., behind stacks, around corners) for customer safety and theft prevention. The children's area needs to be visible from the circulation desk for increased security. The use of glass walls around the children's area may be used to increase visibility into the space.

**2-5.5.1        After-Hours Access.**

Areas such as the café, meeting rooms, restrooms, vending machines, and vestibule should have limited access for after-hours use, with CCTV monitoring and automatic door hardware with timed locking and remote unlocking. These spaces should be connected and visible to the rest of the library but located so they may be used after hours without giving access to the library.

**2-5.6        Technology Center.**

A technology center must include computers for public use along with printers/plotters. Tablets, laptops, headphones, and other equipment can be checked out at the desk. 3D printers may also be provided for use at each installation's discretion.

Checking out of equipment happens in a technology hub and should be located near a heavily circulated area. It should be easily located and monitored by library staff.

**2-6        LOCATION AND DETERMINANTS.**

**2-6.1        Site Evaluation and Location.**

Library facilities should be convenient and located near the center of base activities yet in quiet and uncongested areas. Consider locating them near the health and wellness center, family discovery center, dormitories, housing, and shopping areas where possible. Avoid noisy locations, such as those near arterials, airfields, and industrial facilities. Libraries may be included as parts of composite facilities with other community or mission-related functions or should be close to base educational facilities.

Consider the potential for sharing some functional areas with the BEC and family services utilizing consolidated structures, if possible. Centralized information resources provide one-stop shopping on any subject. However, library collections and technical services must function separately, with only support spaces or information services shared. These facilities should also be readily accessible from the main entrance to the base. Where possible, locate base libraries within walking distance of base operations, housing areas, shopping, and recreational facilities. Consider desirable natural site features, such as trees, vegetation, wetlands or existing water, potential water retention areas, and terrain. Existing natural site features may be incorporated into required site elements like antiterrorism/force protection (AT/FP) setback distances or vehicle barriers that may help to blend the facility into the natural setting of the site.

**2-6.2        Site Size.**

The minimum site area required for a free-standing library is two or three times the gross area of the building. More area may be needed if the site has any special features, such as irregular contours, existing specimen trees, or rock outcroppings to be preserved. Review UFC 3-201-02, *Landscape Architecture*, for guidance and criteria. Assure the selected site will accommodate an adequate number of parking spaces convenient to the library entrance and setback requirements provided in UFC 4-010-01. A preliminary site design must ensure the basic building and site criteria can be accommodated. Site size should provide for future expansion, if practical.

**2-6.3        Site Organization.**

Locate the building on the site to provide the most convenient access to take advantage of desirable views and natural site features. Examples may include providing protection from undesirable winds and glare; shading the building, especially glazed areas, from excessive sun in warm climates; and exposing the reading terrace to sun in cold

climates. Outdoor reading terraces are recommended in most climatic regions. Local base personnel should consider if such outdoor spaces would be used. Locate book and A/V collection boxes either in front of the library near the street or next to a vehicular drop-off loop with convenient sidewalk access for library staff.

### 2-6.4 Access and Visibility.

Provide easy access by automobile and base traffic. Choose a site with a prominent, visible location. The facility should be easily identifiable from approaching cars, base transportation, and pedestrian pathways. See the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD) for the traffic control device requirements.

### 2-6.5 Site Utility Requirements.

Locate libraries for access to major utilities, including water, sewage, electricity, telephone, and gas lines. Provide water service, sanitary and storm systems, natural gas, steam service or fuel oil system (whichever is used), electricity, telephone, and fire alarm service to the building in accordance with UFC 1-200-01, UFC 3-201-01, *Civil Engineering*, UFC 3-210-10, *Low Impact Development*, and local service procedures. Include connections to the base computer network and communication systems.

### 2-6.6 Building Layout and Adjacencies.

To reinforce the library facility's secondary mission—to contribute to the quality of life—additional considerations should be taken for the relationship of adjacent buildings, transportation routes, services, and activities. Managers, base personnel, and design teams should work to locate the library within the base community and built environment to create places or spaces that are destinations and facilitate the programs and services that improve the quality of life for active-duty personnel and their families, retirees, and other authorized customers. The planned creation of destinations with many amenities or attractions in a place for the base community to come together is a quality-of-life force multiplier. Quality of life support is a priority of most facilities; however, installation mission support is always the first priority.

### 2-6.6.1 Accessory Library Connections.

Smaller libraries may not be most beneficial as a stand-alone facility but better contribute to the quality of life or create destinations when connected to or included within a building hosting a complementary function.

### 2-7 BUILDING FUNCTIONAL AREA RELATIONSHIPS.

Internal adjacencies and functional relationships set up a facility for operational success. The entry lobby should have direct access to the meeting/conference rooms, restrooms, and other public support areas. A continually staffed location, such as the circulation desk, will have visual control of the public services, children's, and informational areas. The core building functional areas include:

- Public services areas

- Information services areas

- Meeting space areas

- Children's areas

- Administration areas

- Technical services areas

- Support areas

The scope of operations may vary, depending upon specific installation and size requirements for each facility. Refer to the Functional Area Diagrams in Figure 2-1, Figure 2-2, and Figure 2-3 for an example of this functional relationship translated across facility size. Expeditionary libraries and some medium or small general libraries may be required to combine some core functional areas due to space limitations, existing infrastructure, or unique situations regarding the specific library.

**Figure 2-1  Functional Area Diagram, Small**
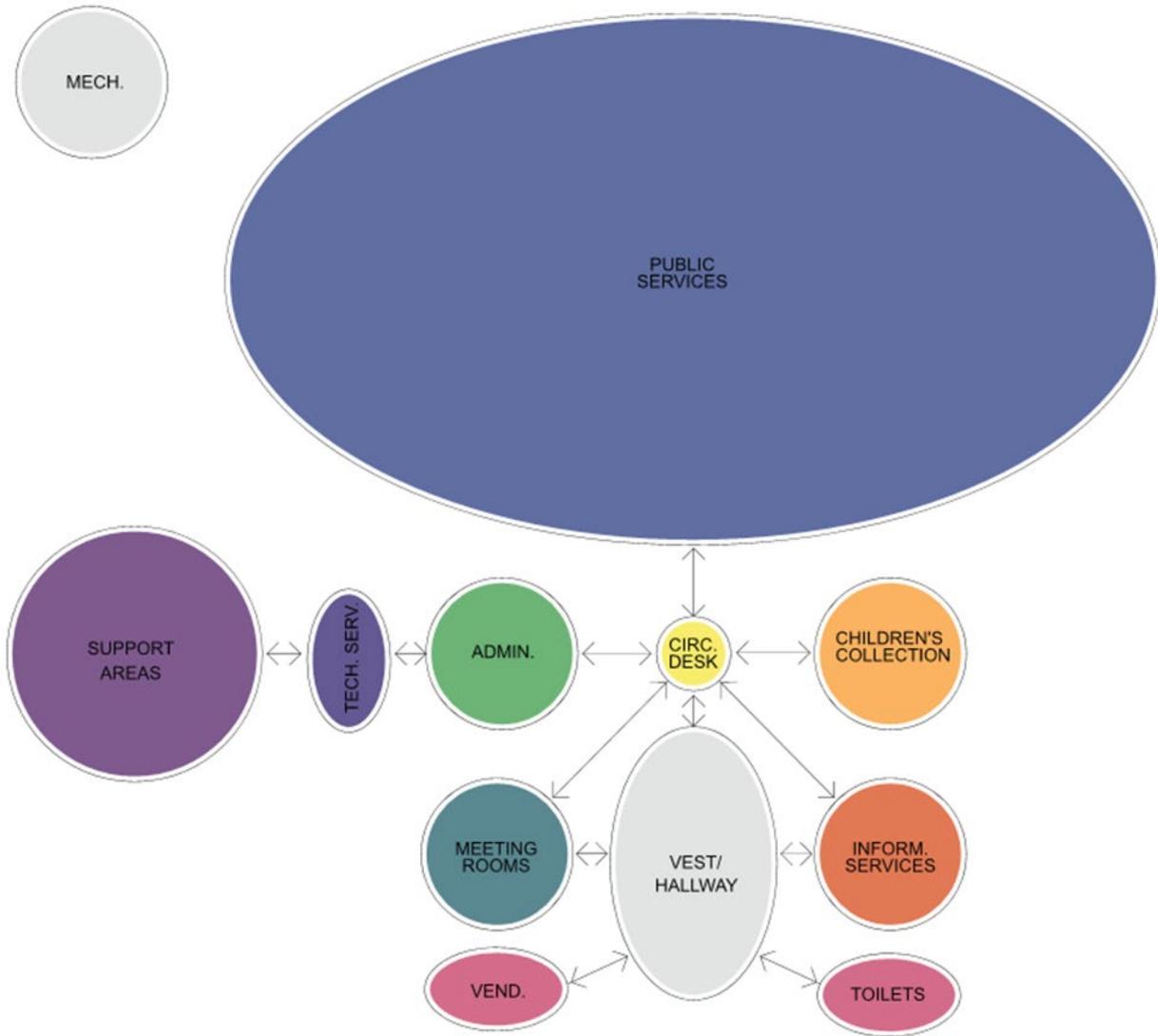


SMALL

**Figure 2-2  Functional Area Diagram, Medium**



MEDIUM

**Figure 2-3  Functional Area Diagram, Large**



LARGE

## 2-8          PROGRAM AREAS.

### 2-8.1          Technical Services Area.

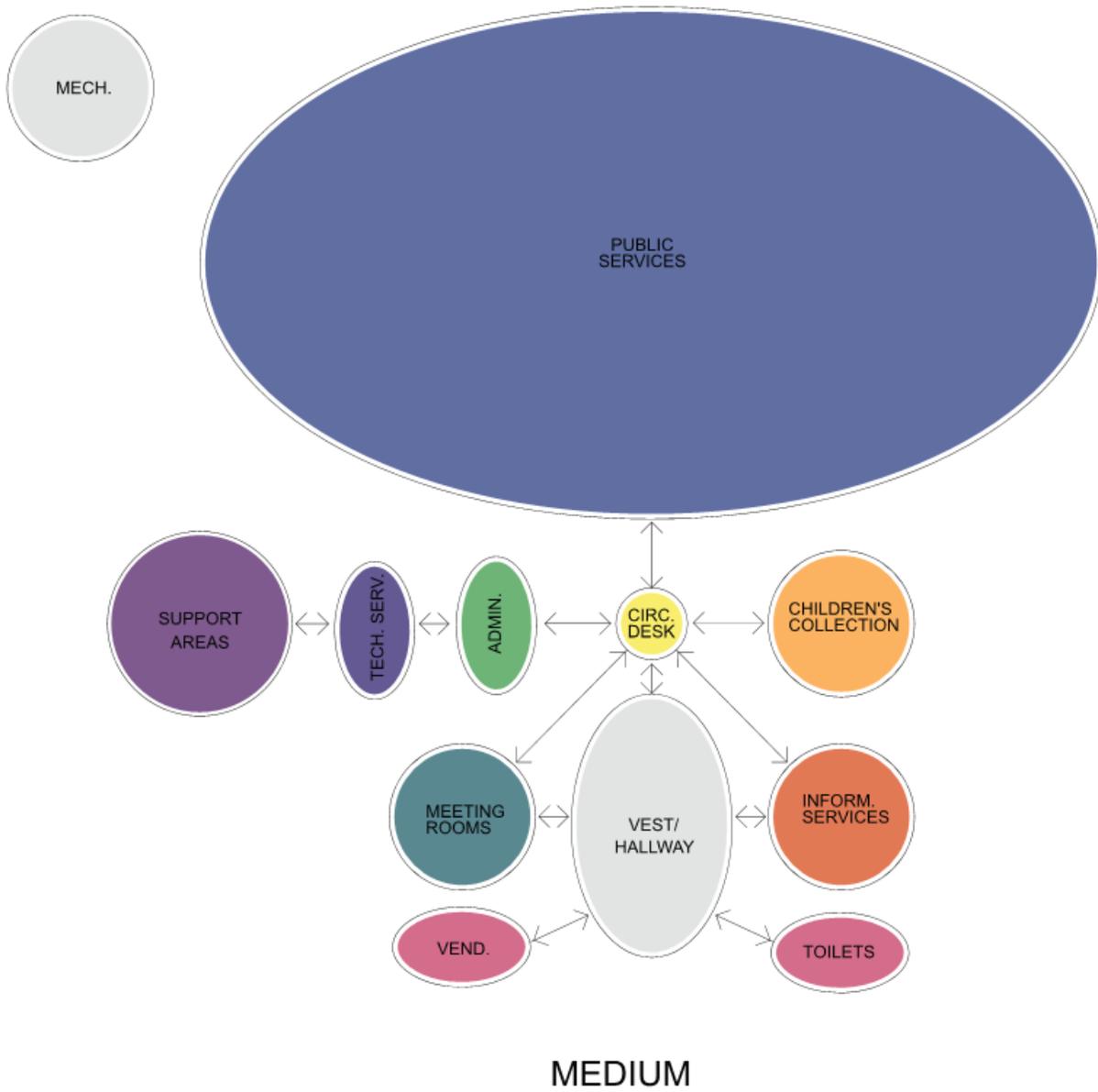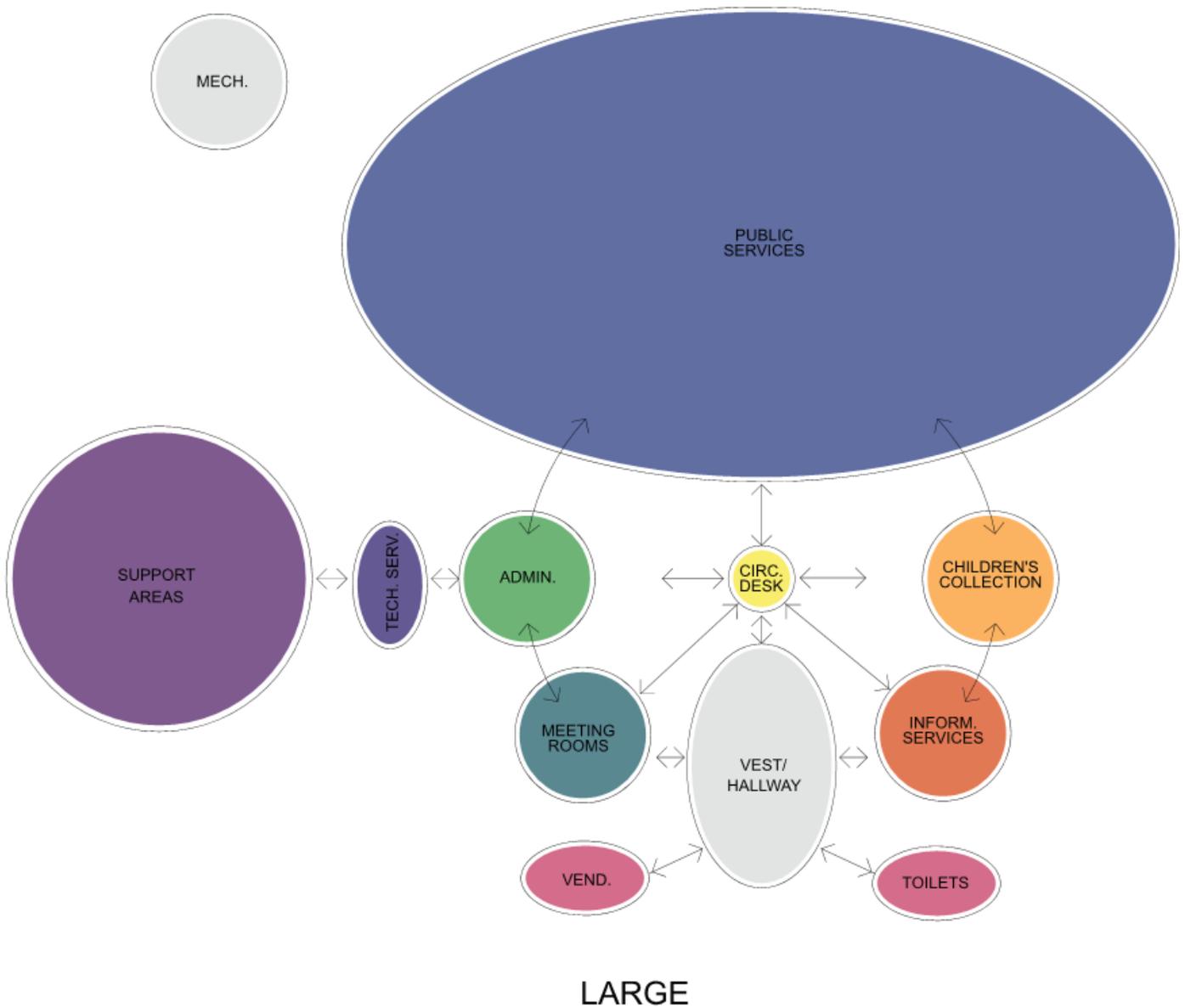Activities conducted in the technical services areas include operational library functions such as acquisitions, cataloging, receiving, and processing collection items. These activities are usually colocated inside a large workroom along with storage areas, supplies, and equipment.

**2-8.2      Administration Area.**

Conference/meeting rooms may be used for meetings, seminars, lectures, story hours and other children's programs, A/V presentations, films, music, temporary exhibitions, receptions, adult study, and other similar functions. Not all events conducted in these rooms will be related to library activities.

**2-8.3      Children's Area.**

Requirements for children's areas will be specific to the installation's dependent population, if any. Typical areas include general and special collections, reading/story/activity areas, and a computer area. The majority of the area must be flexible and utilized for circulation between the collections, meetings, lectures, story hours, and other children's programs that may include A/V presentations, films, music, and temporary exhibitions. Use child-scaled furnishings and equipment with attractive materials, colors, and graphics. Furniture, decorations, toys, and displays may also be used to reinforce the themed environment of the children's areas. Provide visual access or control of the children's area from the circulation desk or similar workstation.

**2-8.4      Information Services Area.**

Computers available for customer use are the primary components of the information services areas. Areas for customer computers will be located in open areas inside public services or in an enclosed room or computer lab. Libraries that select an open area approach should colocate information services with the technology hub described in paragraph 2-8.5.3.

**2-8.4.1      On-Line Public Access Catalog Computers.**

Card catalogs have been replaced by Online Public Access Catalog (OPAC) computer terminals to look up information regarding available materials. These terminals are personal computers that require power and high-speed Internet connections to access data networks. Public access catalog database information is typically managed by outsourced providers to access this information. These terminals may also be used by library staff to access the Integrated Library System (ILS), which is a database of resources.

**2-8.4.2      Reproduction, Fax, and Scanning Areas.**

Provide electrical power for photocopiers and scanners per the manufacturer's specifications. Provide accommodations for a photocopier(s) with payment equipment, as required. Two printers, maintained at the circulation desk, must be networked to the computer stations to allow printouts to be sent from the computer stations and payment collected at the circulation desk. Photocopiers must have scanning capabilities or provide scanning stations within the information services area that include CD burners and other media storage devices as technology changes. Provide accommodations for a fax machine.

**2-8.4.3        Community Technology Room.**

Community technology rooms or "maker space" are dedicated for equipment or technology-based crafting, art, and educational projects by groups and individuals. Science, technology, engineering, math curriculum, and robotics clubs use these spaces for practical application of classroom skills. The installation's specific funding options, volunteers, educational services, and support of mission requirements vary and must be verified for each library. When developing future plans and goals, educational populations must also be considered. Specialized technical solutions for ventilation, lighting, electrical receptacles, plumbing, fire protection, security, and information technology must be matched to each library's community technology room and planned activities.

**2-8.5        Public Services Area.**

The component spaces for public services areas include reader stations, casual reading areas, study areas for individual and group use, general collections storage, reference materials, periodicals, casual browsing, and the circulation area, with support areas. Libraries are now used as meeting and collaboration spaces as often as research and quiet study. The public services spaces should meet the expectation for collaboration, creativity, and group learning as well as provide for traditional study and research by individuals.

**2-8.5.1        Public Services Collections.**

Design public services areas with the main reading space as the focal point. Areas for periodicals, reference collections, and A/V stations need not be in separate rooms but should be well defined. Use alcoves, shelves, furnishings, and architectural elements to define different spaces. Organize public services area functions to match typical library use sequences, starting at the entrance and proceeding to the circulation area, OPAC computer stations, book stacks, and reading areas. Locate functions that require frequent staff assistance, such as OPAC computer stations and A/V stations, close to the circulation desk. Organize shelving for easy collection searches and to accommodate changes in collection sizes and organization. Generally, shelves placed continuously along the edges of a space make searches more difficult than do groupings of parallel shelves. Use full-height shelving instead of partitions to distinguish between primary and secondary reading areas.

Most of the public services and children's spaces should be visible from the circulation desk. This can be done by using low-profile furnishings. For instance, OPAC computer stations and shelving for special or reference collections and book stacks in other critical areas should be limited to a height of 3.5 feet (1000 mm); however, this does not apply to most general collection stack areas. Accommodate the needs and preferences of customers by providing reading areas that vary in size, degree of privacy, orientation to the outside, furnishing types, and arrangement. Provide at least one small area with residential qualities, like soft furniture, for a casual, relaxing atmosphere. The outdoors should be visible from the main reading areas and access from the public services area to an outdoor reading terrace (if utilized) should be provided. Coordinate the location of

convenience outlets with the locations of office and check-out equipment. Small group study areas may be placed near conference/meeting rooms and/or located around the public services areas. Provide accommodations for wireless Internet connectivity throughout the facility.

### 2-8.5.2 Circulation Area and Desk.

The main point of customer service interaction occurs at the circulation desk. When any distancing, safety, or security measures are desired, include them at the circulation desk. Locate the circulation area near the front entrance to facilitate surveillance of the entry lobby, computer area, children's areas, and main reading areas. Traditionally, the circulation desk is fixed but a mobile circulation desk can be utilized if desired. The circulation desk must be visible from the entry lobby and should have overviews of the public services and children's areas. Circulation desks should also have a view of restroom and conference/meeting room entrances. Locate the circulation area near reference, microform (if provided), and A/V spaces. Primary services include check-out/return functions, registering borrowers, processing overdue materials, reserving materials, and assisting customers. Locate drop slots away from queuing lines to facilitate quick returns and avoid bottlenecks. To prevent media damage, provide separate book and A/V drop slots with padding on the customer side of the desk. Locate self-check-out ILS equipment across from or near the circulation desk for supervision and assistance.

Aesthetically pleasing circulation desks should be provided to create favorable customer first impressions. Provide raised counter edges to hide computer equipment and connections, avoid clutter, and enclose storage shelves or cabinets behind the circulation desk. A minimum of 6 feet (1800 mm) clearance should be provided behind the circulation desk for staff activities. Consider including a consultation area or adjacent reading area with seating for customers and library staff adjacent to the reference desk. The reference desk may need to be combined with the circulation area or desk when staff or space is limited.

### 2-8.5.3 Technology Hub.

Locate A/V collections in a highly visible area, preferably near the circulation area, where staff members can easily provide assistance. A/V materials include digital movies, digital music audiobooks, tutorials, and instructional materials. Provide appropriate shelving, cabinets, and browser boxes for each media collection.

In addition, technology such as tablets, laptops, cameras, and headphones can be checked out here with the assistance of library staff. All technology should be securely stored and locked at all times, with the ability to charge while stored.

### 2-8.5.4 Circulation Spaces.

Circulation spaces should be free-flowing and integrated into the functional areas to prevent the perception that they are corridors. Provide durable, easily cleanable floor materials that do not make noise when book carts are used.

**2-8.5.5     Displays and Bulletin Board Areas.**

Provide areas for displays and bulletin boards for presenting information about current events, special programs, and other changeable information. Displays and bulletin boards should be located near high-traffic areas such as lobbies, entry corridors, and similar areas. Vacant wall space should be considered for these display requirements along with areas for freestanding easels or kiosks. Consider the need for display furniture, wall-mounted boards, and lockable cabinets. Provide display areas for print materials, three-dimensional objects, art, special promotions, community newspapers, areas for new book and A/V displays, and/or space for a central information kiosk, as needed.

**2-8.5.6     Material Collections.**

Material collections are composed of books, periodicals, maps, documents, computer software, and A/V resources. These collections are frequently available online as subscriptions.

**2-8.5.6.1     General Collections.**

Areas for general collections are composed of book stacks for fiction, non-fiction, and paperback books that occupy a large majority of the public services space. The size of the general collections and reading areas must be balanced between the required number of reader stations and the size of the general book collection (including growth). Military libraries vary considerably in the sizes of their general collections and their needs for reader stations. The balance of space allocation to stacks and readers must be determined individually for the facility in question. Consider the need for OPAC computer stations located within the general collection stacks for customer and staff convenience.

**2-8.5.6.2     Special Collections.**

Examples of special collections include rare books, personal papers, and unique materials. These collections are segregated from the general collection stacks. Requirements for special collections will vary at each installation. Provide a separate designated area for a paperback book swap display near primary circulation areas.

Examples of special collections include recommended reading lists, leased books, current events, local interest items, testing/educational materials, learning programs, and college course materials.

**2-8.5.6.3     Reference Collections.**

Many libraries provide reference material with online subscriptions or more condensed materials. When provided, reference collections will be installation-specific and may include lower-height book stacks, file cabinets for maps and pamphlets, and stands for dictionaries and atlases. Provide tables and chairs for viewing reference materials since they are not usually checked out.

**2-8.5.6.4      Periodicals.**

Libraries often provide periodical collections through online information catalogs and subscriptions that can be accessed with public computers (see paragraph 2-8.4.1). Where included, design periodical areas to include display shelving for magazines, newspaper racks, lounge chairs, accessory tables, and worktables. Provide a comfortable and inviting reading area, similar to upscale commercial bookstores, near the periodical collections. Utilize display shelves designed for magazines with storage areas behind for back issues.

**2-8.5.6.5      Reading Area.**

Reading areas are composed of major and minor reading spaces. The majority of the reader stations should be located in the main reading space of the public services area. Minor reading spaces, containing some portion of the total reader stations, may be scattered about in semi-remote locations for private reading or study. Small general, branch, field, and expeditionary libraries may not be sized to accommodate minor reading spaces. Provide data ports and flush electrical outlets for laptops and other equipment in the floor at each reading station. Coordinate spacing and location of electrical outlets with the furnishing's layout. Major reading areas should include moveable furniture to accommodate group events.

**2-8.5.6.6      Collaboration Space.**

A number of collaboration spaces should be spaced throughout and located within the reading spaces. Each collaboration space would reasonably seat three to five people at a worksurface. Partial-height walls or furniture may be used to define the space and give some privacy to the users. These are in addition to small study rooms (see paragraph 2-8.6.2). Consult with the installation on the specific number or desired elements.

**2-8.5.6.7      Teen Areas.**

Provide a dedicated space within the public services area for teenagers with material (general and special) collections, reading areas, small group study area with materials, selections and furnishings dedicated for teen audiences, and special interest teen items, like magazines. Partially enclosed spaces near periodicals, A/V stations, and other items frequently used by teenagers are good locations for teen areas. Do not locate the teen area within the children's areas. Teen areas should be designed with similar criteria and infrastructure to match adult program spaces. Provide computer stations with earphones and computer data ports for laptops, where possible.

**2-8.6      Meeting Space Area.**

The meeting spaces described below include conference/meeting rooms of various sizes, cafés, and other amenities that may be used for meetings, seminars, lectures, A/V presentations, films, music, temporary exhibitions, receptions, adult study, and other similar functions. Not all events conducted in these rooms will be related to library

activities. These meeting spaces should individually be considered for access outside of operational hours.

### 2-8.6.1 Conference Room.

Locate conference/meeting rooms off the entry lobby so its hours do not have to coincide with the library's hours. Designs should accommodate groups of different sizes (from a seating capacity of 30 for smaller facilities to 80 for larger ones) and a variety of furnishing arrangements. Consider a moveable partition in larger conference/meeting rooms so two simultaneous functions can occur, but only if requirements for maintenance, performance, and added value can be met. In this case, each room must have direct access to the entry lobby for separate access control and ensure each portion of the room has the required egress routes or emergency doors as required by codes. Design the room so it can be darkened for film presentations. Provide locally controlled dimmer switches for lights. Consider the need for telephone and video conferencing and provide the required infrastructure to provide these capabilities. For large conference rooms, consider the need for a small enclosed kitchenette with folding doors.

Locate the speaker's areas to reduce disturbances from people entering and exiting and from direct sunlight and glare. Do not place windows directly behind the speaker's position. Provide a coat closet near the door and lockable storage that is directly accessible from the conference/meeting rooms. Storage rooms should be large enough to accommodate storing tables and stacking chairs used in the activity rooms. For divisible rooms, this storage will be located in a common area that provides access from each room, such as off the entry lobby. Provide modular furniture and conference tables with Internet access, a speaker phone, and data and power accommodations. Provide a drop-down projection screen and wall-mounted whiteboards. Consider providing a smart board connected electronically to a networked printer. Provide millwork for conference materials, storage, displays, or refreshments. Provide a credenza for storage, A/V cart, and trash/recycling cans.

### 2-8.6.2 Small Group Study Area.

Small group study areas may consist of enclosed rooms and small tables with chairs located in open but secluded areas. Enclosed rooms that accommodate two to four people require approximately 150 square feet (14 square meters). Rooms that accommodate two people require approximately 75 square feet (7 square meters). Small group study areas require comfortable chairs and tables with two to four seats. Provide a whiteboard and trash cans in each enclosed small group study room. Provide ventilation in accordance with UFC 3-410-01, *Design: Heating, Ventilating, and Air Conditioning Systems*, lighting with controllable levels, and data ports and electrical outlets for computers and/or laptops. Provide some private, one-person study rooms with glass doors, where possible, for individual study and test preparation. All enclosed group study rooms should be acoustically sound to minimize disruptive and distracting noise.

### 2-8.6.3 Coffee Stands and Cafés.

Consider the need for a coffee stand/café within the non-secured area of the library lobby to serve coffee, espresso, other beverages, light snacks, and other items similar to those served in commercial bookstores and public libraries. Vendor services should be provided by outside sources and should not be considered part of the responsibilities of the library staff. Coffee cafés should be located near the main entrance area in a prominent location that will not disturb library operations. Locate coffee cafés in an area of the library such as a shared lobby that can be accessible to the public during hours when the rest of the library facility is closed and secured. Consider the need for an additional exterior entrance to the coffee café and locate appropriately.

### 2-8.6.4 Public Restrooms.

Provide male, female, and family accessible restrooms according to ABA requirements. The number of toilets and urinals required will vary according to the overall size of each facility. Locate restrooms off the entry lobby to allow access for users of the conference rooms and coffee café during times when the library is closed. In such cases, provide a night security closure at the access control point to secure the rest of the library.

### 2-8.6.5 Water Fountain.

Locate public water fountains near the restrooms. Include full-height and wheelchair-accessible water fountains according to ABA requirements.

### 2-8.6.6 Vending Machines.

Address the need for snack or drink machines and other vendor-supplied equipment located near the lobby or vestibule. Locate vending machines in an alcove or area with only a partial view from the entrance or lobby. Do not place vending machines at the entrance or in the lobby because it is unsightly. Provide an anchor or bracket to secure vending machines.

### 2-8.6.7 Outdoor Reading Terraces.

Where the climate permits, consider an outdoor reading terrace that may be used for adult casual reading or children's story hours as an enriching addition to a library. The terrace should be entered from spaces visible from the circulation desk and should have no exits to the outside except for emergency egress. Local conditions, such as siting, building configuration, budget, and anticipated use, should be used to justify the appropriate size requirements.

### 2-8.7 Support Area.

Core areas that support the overall facility include the vestibule/airlock at the entrance, lobby, and circulation areas throughout the facility. Support areas like restrooms and water fountains may need to be located outside the access control point of the library for public access outside of operating service hours. Staff-only support areas include the loading dock, storage, and mechanical rooms.

### 2-8.7.1    Loading and Receiving Docks.

Provide a covered loading area and double-wide exterior doors. Asphalt or concrete access drives to the loading dock must be a minimum of 12 feet (3650 mm) wide for access by large trucks. Consider the requirements for commercial shipping and delivery companies and large furniture deliveries. Provide easy access to dumpsters or outside trash containers. Provide a doorbell or buzzer at the loading dock entrance door that can be heard in the administration and technical services areas. For Navy and Marine Corps facilities, provide a fall protection system in accordance with OPNAV M-5100.23, *Navy Safety and Occupational Health Manual*, where the elevation between the floor edge of the dock and adjacent surface is 4 ft (1.2 m) or greater.

### 2-8.7.2    Storage Areas.

Storage areas are vital to librarians for multiple reasons, including:

- Monthly in-processing and out-processing of lease materials
- Storage of supplies, which are usually bought in bulk at the end of the year
- New books, which are often bought in bulk at the end of the year
- Items going to Defense Logistics Agency (DLA) Disposition Services
- Seasonal displays and decorations
- Supplies, copier paper, and crafts for story time all require adequate storage

Provide storage closets, where possible, to maximize the use of available space. Provide lockable doors on all storage closets. Locate an open storage area near the loading dock for items being shipped or received. Verify storage requirements with the library director at each facility since special storage requirements may be required.

### 2-8.7.3    Janitor Closets.

Locate the janitor closets near the restrooms. Provide a floor-mounted mop sink, dry storage for supplies, shelves for maintenance supplies, and a sloped floor with a floor drain. Provide shelves and hooks for cleaning and maintenance equipment storage. All surfaces must have water-resistant finishes. Include enough room for a mobile cleaning cart.

### 2-8.7.4    Mechanical Rooms.

Utilize mechanical rooms, as required, for HVAC, plumbing, electrical, hot water, telephone, fire suppression, and other building systems equipment. Locate mechanical rooms so they have entry and service doors located on the outside of the building only to minimize noise and service disruptions. Provide sound proofing, where required. Utilize a sloped floor towards a floor drain for rooms with equipment involving water or that may leak.

**2-9          SITE DESIGN ELEMENTS.**

Site the library so the main entrance is clearly visible and the architecture provides intuitive wayfinding cues to guide visitors to the main entrance. Preserve and utilize natural site features, such as topography, trees, greenery, and rock outcroppings, to help define the site and accent the building. Use landscape elements to provide definition, screening, and focus for the site.

**2-9.1.1          Outdoor Reading Area.**

Depending on the climate, it may be shaded or exposed to the sun, or variable with the time of day. The enclosure should be a minimum of 6 feet (2 meters) high and visually permeable. Durable outdoor furnishings, furniture, and shading should be provided. Local conditions, such as siting, building configuration, budget, and anticipated use, should be used to justify the appropriate size requirements.

**2-9.1.2          Book Drop-Off.**

Book and A/V collection boxes should be located with customer convenience in mind and allow drivers to place materials in collection boxes from their cars when the library is closed. Building openings for collection boxes create AT/FP vulnerabilities and should not be incorporated in new construction. Existing building collection boxes should be replaced with remote boxes and these building penetrations should be permanently sealed. Remote collection boxes should be outside the minimum stand-off distances required by UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings.*

Locate remote book and A/V collection boxes where they offer the most convenient access for customers but do not cause traffic problems. Potential locations include at the front of the library near the street or next to a vehicular drop-off loop road. Remote collection boxes should be located on the driver's side of the drop-off lane in an island. Provide an efficient pathway from the collection boxes to the staff entrance to minimize the effort required to return these materials to the work room area without utilizing the public entrance to the facility. A/V collection boxes should be padded to prevent potential damage to A/V media. Consider utilizing combination units that feature both types of collection boxes and the potential impact of severe weather, pick-up or "grab and go" equipment or improvements for convenience and safety of patrons, and a covered area to shelter the collection boxes drop-off point.

**2-9.1.3          Transit Connections.**

Access through base/installation or public transit infrastructure is a program goal and assumed by locating the library on service routes or providing such infrastructure. As an alternative, consider locating libraries at the installation visitor's center, on- or off-installation high-traffic commercial/retail centers, or similar centers of activity. Provide covered waiting areas and seating that is publicly visible to encourage access to locations shown to have multimodal transportation choices.

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# CHAPTER 3 DESIGN

## 3-1      GENERAL.

This chapter provides general design and material guidance, including requirements for the site, plus building exterior and interior areas. The focus of this information is library-specific issues; general professional knowledge with which A/Es are familiar is not addressed. These guidelines address design considerations for site and building layout, architectural character, function, circulation, and facility systems. Information is provided regarding the preferred materials and finishes that deliver the required durability yet are still aesthetically pleasing. Functional diagrams and other guidance regarding potential layout configurations for different styles of building design are provided to illustrate how the functional area could potentially be organized.

Facility systems information is also provided regarding structural considerations, HVAC systems, plumbing, electrical, fire protection, life safety, communications, A/V requirements, alarm/security systems, and acoustical requirements. Non-government resources from the American Library Association (ALA) are not required but may help in design solutions or facilitate the preparation of specifications and contract documents (see Appendix C).

## 3-2      DISCIPLINE-SPECIFIC CONTENT.

### 3-2.1      Civil Engineering.

Connect libraries to utilities, including water, sewage, electricity, telephone, and gas lines. Provide water service, sanitary and storm systems, natural gas, steam service or fuel oil system (whichever is used), electricity, telephone, and fire alarm service to the building in accordance with requirements of UFC 1-200-01, UFC 3-201-01, UFC 3-210-10, and local service procedures. Include connections to the base computer network and communication systems.

### 3-2.1.1      Drainage.

Reference UFC 1-200-02 and UFC 3-201-01. The A/E should coordinate with local requirements, strategies, base master-drainage plan, and the site-specific geology/soils report.

### 3-2.1.2      Vehicle Circulation.

Where possible, locate parking areas to the sides of the building where they will not dominate the building entrance. Provide adequate light levels at night in all parking areas for security and safety and handicapped-accessible parking spaces. Consider the need for a dedicated staff parking area located near the staff-only entrance to the building. Spaces for motorcycles and bicycles should also be provided as required by the base population. Consider the location of bicycle racks near the main entrance in a secure location. Refer to UFC 3-201-01 for detailed information regarding vehicle circulation and parking requirements.

### 3-2.1.3        Site Design.

Site design and engineering must minimize cost and disturbance with consideration of the need to preserve and utilize natural site features, such as topography, hydrological features, trees, greenery, and rock outcroppings to help define the site and accent the building. Use landscape elements to provide definition and focus for the site, with screening from site liabilities if appropriate.

### 3-2.2        Landscape Architecture.

Refer to UFC 3-201-02 for additional information regarding landscape architecture.

### 3-2.2.1        Plantings.

Use indigenous plants that are appropriate for the climate and local base conditions. Landscape plantings can dramatically improve the first impression of a facility and help control erosion. In some instances, landscaping may also reduce maintenance requirements. Follow sustainable design principles for xeriscaping and low-water-usage plant design. Do not use poisonous or toxic plants.

### 3-2.2.2        AT/FP.

The existing landscape may also be used to create stand-off distances required for effective AT/FP measures and create buffer zones around the facility. Refer to UFC 4-010-01 for more information.

### 3-2.3        Architecture.

The architectural and interior design of the library must be integral and related. They both involve functional analysis and consideration of the appropriate aesthetic or stylistic character, building organization, circulation, supervision, and flexibility requirements, as well as finishes and furnishings. Present an open, inviting image while providing visibility of attractive activities from the approach and entrance. The library should have spaces that vary in character and scale to support different activities. Spaces should emulate the environments found at upscale commercial bookstores, with a range of lounge-like areas. The main activity areas should be grouped in a continuously visible sequence, with easy access between spaces. Single-level facilities are preferred. Refer to UFC 3-101-01, *Architecture*, for more information and follow base or installation guidance requirements.

Create an individual theme for the facility that may be host nation or base/installation related. Many thematic environments can best be presented in lobbies, primary circulation areas, and the main reading area for adults. Theming should apply continuously to the entire design of the facility, from overall architectural expression to specific interior development. The architectural character should reinforce the focus of the building on the main reading room and reader activity spaces. Service and support areas should be subordinate and, where appropriate, expressed as secondary volumes. The library should have a distinctive presence on the base. Materials and detailing should be of high quality, equal to those of the most significant buildings on the base.

The architectural style must comply with installation-specific requirements and be compatible with UFC 3-120-10, *Interior Design*.

### 3-2.3.1 Daylighting.

Controlled, indirect daylight should be admitted into reading areas through clerestories, skylights, or windows. Use of daylight will reduce the load on electric lights, reduce reader eye strain (eye strain is greatest with fluorescents), and permit visual connection to the outside. Review and implement the criteria in UFC 3-530-01, *Interior and Exterior Lighting Systems and Controls*, to the extent appropriate for libraries. However, care must be taken not to expose books to direct sunlight to avoid damage from ultraviolet (UV) rays. Consider sunlight-filtering devices applied to windows and solar shade screens to reduce UV exposure and reduce thermal heat gain. A passive solar design (described in UFC 1-200-02) applied to libraries requires specific efforts to manage glare, UV, and heat gain. Automatic shades or control devices (programmable), sufficient to block UV exposure are required. Refer to UFC 3-101-01.

### 3-2.4 Interior Design.

Choose furniture that is durable, comfortable, and attractive. Solid wood is a good choice and natural finishes can be used to accentuate the interior décor. Circulation and reference desks need durable counters and front panels, such as metal, granite, or solid surface composite materials. Consider modular furniture components designed specifically for libraries. Counter fronts are high maintenance and require highly durable materials because of wear and tear. People stand, lean, or press against the counter materials at all levels of height, including child heights. Current systems furniture options should be considered as a potential solution for library counters. If a systems furniture library counter is not included, it should at least be considered as a supplementary or complementary feature to provide adaptability for process and technology changes at the circulation area.

Consider graffiti-proof furniture and materials in bathrooms, small group study areas, and other secluded places not easily visible by staff members. Floor material colors and textures will be primary considerations for selecting coordinated furniture and equipment. Do not use compact or high-density shelving in areas accessible to the public. Use book stacks with heavy-duty construction and consider the use of 16-gauge metal stacks and shelves specifically designed for library use that can be secured to avoid being knocked over yet still be moved with books in place. This is very beneficial when rearranging stacks or replacing carpet because books do not need to be removed to relocate the stacks. Wooden book stacks are more attractive and quieter than metal stacks but may require moving books prior to relocation. If single-tier steel bracket shelving is used, follow ANSI/NISO Z39.73-1994 (R2012), *Single-Tier Steel Bracket Library Shelving*. Refer to UFC 3-120-10 for more information.

### 3-2.5 Geotechnical Engineering.

Refer to UFC 3-220-01, *Geotechnical Engineering*.

### 3-2.6        Structural Engineering.

Select an economical structural system based on facility size, projected load requirements, local availability of materials and labor, and wind, snow, seismic, geologic, and permafrost conditions. Provide consideration for addition or expansion of projected future needs to easily and economically accommodate future requirements; however, do not over-design the initial construction. Structural bay sizes should reflect space requirements, economy, and subsystem dimensions, such as masonry units and ceiling grids. Structural bay sizes should be compatible with standard shelving unit sizes and standard row-to-row dimensions. Keep to two stories or fewer where possible or the costs associated with designing-in progressive collapse criteria will need to be incorporated. Reference UFC 3-301-01, *Structural Engineering*, for general and location-specific soil, structural, and code requirements.

### 3-2.7        Fire Protection.

Fire protection and life safety designs must comply with the following sources for detailed guidelines and specifications:

- UFC 3-600-01, *Fire Protection Engineering for Facilities*
- UFC 3-601-02, *Fire Protection Systems Inspection, Testing, and Maintenance*
- Latest edition of the NFPA standards

Occupancy for libraries is classified as assembly by NFPA 101, *Life Safety Code.* Fire protection systems must conform to conventional United States standards and codes. All new and refurbished buildings must have automatic fire detection and/or fire suppression systems, which must be monitored to send signals to the base fire station and/or central control or monitoring facilities. All materials and equipment must be Underwriters Laboratory (UL) listed or Fire Marshal approved. The provision of fire protection systems and equipment must be reviewed for all new and refurbished buildings as part of a "fire risk analysis" and "fire strategy" study, executed during the design period. During the design period, careful consideration must be given to the selection of specific design codes, standards, base-specific criteria, and base fire officer requirements that affect the equipment specifications, design, and installation. Equipment selections should not be considered in isolation, but be reviewed in unison with the overall fire strategy for each building and installation.

### 3-2.8        Mechanical Engineering.

Provide HVAC systems in compliance with the current edition of the International Mechanical Code (IMC), UFC 3-410-01, and UFC 3-410-02, *Direct Digital Control for HVAC and Other Building Control Systems*. Comply with the recommendations of ASHRAE where applicable by UFC or referenced standards. Perform a lifecycle cost analysis of available energy sources. Due to the nature of the materials and stacks within the libraries, do not program night setbacks or unoccupied modes for the HVAC system unless reports and calculations accounting for humidity and thermal mass of library materials are accepted by base command/AHJ. Provide zone control for

maintaining different environmental conditions in each functional area. HVAC systems for activity areas, like conference and meeting rooms, should be designed to allow night-time operation while the rest of the facility is closed. Ductwork serving the children's areas and the activity areas must be designed to help acoustically separate those areas from the rest of the facility. Provide tamper-proof thermostats that may be internally controlled by the facility manager. Provide programmable controls and use security features so they are only accessible to authorized personnel. Design of new facilities must ensure that building energy consumption must not exceed DoD energy budget figures.

### 3-2.8.1    Library Materials Environment.

To help protect and preserve library materials, maintaining stable conditions is crucial. Per NISO TR01-1995, *Environmental Guidelines for the Storage of Paper Records*, fluctuations in temperature increase the degradation rate of paper relative to storage at one temperature. In accordance with NISO TR01-1995, the maximum recommended temperature for combined stack and customer spaces in libraries is a stable temperature no higher than 70 °F (21.1 °C) and a stable relative humidity between 30 percent and 50 percent. Institutions should choose a temperature and relative humidity within the recommended ranges that can be maintained 24 hours a day, 365 days a year. The climate-control system should never be turned off and settings should not be lowered at night, on weekends, or at other times when the library is closed. Additional costs incurred by keeping the system in constant operation will be far less than the cost of future conservation treatment to repair damage caused by poor climate.

Libraries with separate rooms for archives and/or special collections may have specific storage needs for various formats, including historic documents, photographs, film, maps, and rare books. Consult NARA Directive 1571, *Archival Storage Standards*, or the Society of American Archivists (SAA) (see Appendix C) for appropriate temperature and humidity standards.

### 3-2.8.2    Particular Space Engineering.

Certain rooms within the library, such as conference rooms, will be densely occupied at irregular or infrequent intervals as described in UFC 3-410-01. Consider the anticipated occupancy pattern when developing the HVAC equipment layout and sequence of operation to ensure that overall lifecycle cost is minimized. Evaluate opportunities, such as demand-controlled ventilation by occupancy sensors, for these room types.

Comply with AT/FP requirements in the design of HVAC systems. To ensure durability, consider climate conditions, high humidity, industrial atmosphere, saltwater exposure, or other adverse conditions when selecting exterior HVAC components. Design building HVAC systems to accommodate long-term flexibility, renovations, and additions.

### 3-2.9       Electrical Engineering.

Provide electrical service and distribution equipment, wiring receptacles and grounding, interior and exterior lighting and controls, emergency lighting, telephones, communication systems, fire alarms, and intrusion systems in accordance with UFC 3-520-01, *Interior Electrical Systems*, NFPA 70, *National Electric Code*, and the latest installation design requirements. See the International Trade Administration's Electric Current Worldwide website to determine voltages and cycles in overseas locations (https://legacy.trade.gov/mas/ian/ECW/index.html). Review and implement the criteria in UFC 3-530-01 to the extent appropriate for libraries.

Evaluate and include the following power needs to determine the required electrical service capacities: HVAC systems, technology hub, A/V equipment, computers or terminals, media, copiers, printers, theft detectors, other special equipment required by users, and considerations for expansion. Provide metering for electrical power. Secondary underground service raceways may be PVC Schedule 40. Service grounding system and all wiring methods must meet National Electric Code (NEC) requirements.

### 3-2.9.1       Receptacle Access.

General convenience receptacles and special power outlets must be specification grade. General spacing of convenience receptacles must be a maximum of 12 feet (3600 mm) on center and 5 feet (1500 mm) on center where carrels occur. Additional access to power and data through access flooring floor outlets or wall outlets should be considered and coordinated with the furnishing plan and activities/uses programmed for task lighting, equipment, computer/projector setup, and user convenience. Provide electrical outlets and public access Wi-Fi for laptops or personal devices in the study areas, reading areas, and coffee cafés. Consider the need for additional electrical outlets at circulation and reference desks, work rooms, offices for staff use, A/V areas, and in reading areas for customer use. The type and scope of computer systems that may be used can vary depending on local base decisions and technological developments.

Provide an intrusion detection alarm system and wall clocks in all functional areas.

### 3-2.10       Information Technology (Low-Voltage).

Reference UFC 3-580-01, *Telecommunications Interior Infrastructure Planning and Design*.

### 3-2.10.1       Public Internet and Exterior Resource Access.

Provide commercial Internet access for public and patron use at most computers and Wi-Fi throughout the facility.

### 3-2.11 Plumbing.

Provide domestic hot and cold water, sanitary and storm drainage, plus propane or natural gas systems (if required) in accordance with design requirements established in UFC 3-420-01, *Plumbing Systems*, and the International Building Code (IBC). Provide hot and cold water to all restrooms, sinks, janitor's closets, and coffee cafés. Provide a water bottle-filling station with the water fountain. Hot water temperature must not exceed 105 °F (40 °C) at the outlet. Provide floor drains in restrooms and janitor's closets. Provide shut-off valves at all fixtures. Provide frost-free hose bibs on all exterior walls if justified by local climatic conditions. Provide metering for gas service. Provide water metering for water conservation and maintenance measures.

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**CHAPTER 4 FUNCTIONAL DATA SHEETS**

**4-1          ADMINISTRATION.**

Requirements for administration areas are the same for all types and sizes of libraries. Only the size requirements will vary depending upon the overall size requirements of the entire facility. If possible, design administration areas with visibility to the outdoors and/or interior of the library.

**4-2          FUNCTIONAL DATA SHEETS.**

Functional data sheets are intended to provide the minimum requirements for the respective rooms and spaces.

**Table 4-1   Circulation Area**

| Description/Usage | The circulation area includes the circulation desk and is the main point of contact for information and assistance. |
|---|---|
| **Occupancy Density** | As reception/lobby of an office, 10 to 30 per 1000 ft$^2$ (93 m$^2$), including staff work stations, regularly occupied spaces. |
| **Min. Ceiling Ht.** | 8 ft (2.4 m) minimum |
| **Finishes** | **Walls.** Provide a low-maintenance, durable finish. **Floors:** Durable flooring that absorbs sound and can be cleaned. **Ceiling:** Changes in ceiling type and heights should be utilized to guide people to the circulation desk. Consider acoustics and light reflectance in ceiling selection. |
| **Plumbing** | None required. |
| **HVAC** | Provide system per paragraph 3-2.8. |
| **Fire Protection** | Provide system per paragraph 3-2.7. |
| **Power** | Provide outlets per paragraph 3-2.9. |
| **Lighting** | Provide system per paragraph 3-2.9. |
| **Communication** | **CCTV.** Required. **CATV/Internal Video.** Required. **PA/Audio.** Provide phone or microphone connected to library PA system. Coordinate with installation needs, processes, and equipment. **Telephone.** Required, 2 minimum. **Data.** Required at each workstation to access the ILS database. Provide connections to outside computer networks. **Security.** Provide security camera monitors located out of the view of customers. Include space for lost and found items to be stored and provide lockable storage for staff personal items. |
| **Acoustics** | Meet library criteria in UFC 3-101-01 and provide an area of finishes with NRC of 0.70 or higher to equal or exceed the floor area of this room/area. |
| **Casework/Built-in Equipment** | Coordinate with installation needs, processes, and equipment. Circulation desk should be durable and abuse-resistant. Coordinate requirements for drawers, cabinets, browser boxes, and must be coordinated with end user's needs, processes, and equipment. Provide |

| | shelving and space for parking carts behind the desk to accommodate returned materials. |
|---|---|
| **Furnishings Fixtures & Equipment (FF&E)** | Equip the circulation desk. Coordinate with installation needs, processes, and equipment. Provide anti-fatigue mats behind the service counter areas where staff may stand for extended periods. |
| **User-provided Equipment** | Computers, workstation equipment, and ILS. Coordinate with installation. |
| **Special Requirements** | Visual connections and control of entrance, public spaces, and circulation. |

## Table 4-2   Reading Area

| Description/Usage | Reading areas are composed of major and minor reading spaces. The majority of the reader stations should be located in the main reading space of the public services area. |
|---|---|
| **Occupancy Density** | As library, 10 per 1000 ft$^2$ (93 m$^2$) or as most dense use when multi-functional. Confirm with reading stations and open study seats, which may create higher density. |
| **Min. Ceiling Ht.** | 8 ft (2.4 m) minimum |
| **Finishes** | **Walls:** Provide a low-maintenance, durable finish.<br><br>**Floors:** Flooring should be sound-absorptive, durable, and easy to maintain despite rolling book carts.<br><br>**Ceiling:** Provide acoustic absorption (NRC) and light reflectance (LRV) in support of room functions and lighting. |
| **Plumbing** | None required. |
| **HVAC** | Provide system per paragraph 3-2.8. |
| **Fire Protection** | Provide system per paragraph 3-2.7. |
| **Power** | Provide outlets per paragraph 3-2.9. |
| **Lighting** | Provide system per paragraph 3-2.9. |
| **Communication** | **CCTV.** None required.<br><br>**CATV/Internal Video.** None required.<br><br>**PA/Audio.** Coordinate with installation needs, processes, and equipment.<br><br>**Telephone.** None required.<br><br>**Data.** Coordinate with installation needs, processes, and equipment.<br><br>**Security.** None required. |
| **Acoustics** | Meet library criteria in UFC 3-101-01 and provide an area of finishes with NRC of 0.70 or higher to equal or exceed the floor area of this room/area. |
| **Casework/Built-in Equipment** | Seating and tabletops optional for minor reading areas (or FF&E). |
| **Furnishings Fixtures & Equipment (FF&E)** | Seating, tables, and activity support furniture should be mobile and multi-function. |
| **User-provided Equipment** | TBD by the installation. |
| **Special Requirements** | Multi-use space and multi-function amenities. |

**Table 4-3  Children's Area**

| Description/Usage | The children's area includes general and special collections, reading/story/activity areas, and a computer area. |
|---|---|
| **Occupancy Density** | As library, 10 per 1000 ft$^2$ (93 m$^2$) or as most dense use when multi-functional. Confirm with reading stations and event/activity seats, which may create higher density. |
| **Min. Ceiling Ht.** | 8 ft (2.4 m) minimum |
| **Finishes** | **Walls:** Provide a low-maintenance, durable finish in child-friendly colors.<br><br>**Floors:** Flooring should be sound-absorptive, durable, and easy to maintain with activities and book carts.<br><br>**Ceiling:** Provide acoustic absorption (NRC) and light reflectance (LRV) in support of room functions and lighting. |
| **Plumbing** | None required. |
| **HVAC** | Provide system per paragraph 3-2.8. |
| **Fire Protection** | Provide system per paragraph 3-2.7. |
| **Power** | Provide outlets per paragraph 3-2.9. |
| **Lighting** | Provide system per paragraph 3-2.9. |
| **Communication** | **CCTV.** None required.<br><br>**CATV/Internal Video.** None required.<br><br>**PA/Audio.** Coordinate with installation needs, processes, and equipment.<br><br>**Telephone.** None required.<br><br>**Data.** Coordinate with installation needs, processes, and equipment.<br><br>**Security.** None required. |
| **Acoustics** | Meet library criteria in UFC 3-101-01 and provide an area of finishes with NRC of 0.70 or higher to equal or exceed the floor area of this room/area. |
| **Casework/Built-in Equipment** | Seating and tabletops optional for minor reading areas (or FF&E). |
| **Furnishings Fixtures & Equipment (FF&E)** | Seating, tables, and activity support furniture should be mobile and multi-function. |
| **User-provided Equipment** | TBD by the installation. |
| **Special Requirements** | Multi-use space and multi-function amenities. |

**Table 4-4   General and Reference Collections**

| Description/Usage | Areas for general collections are composed of book stacks for fiction, non-fiction, and paperback books that occupy a large majority of the public services space. |
|---|---|
| **Occupancy Density** | As library, 10 per 1000 ft$^2$ (93 m$^2$) or as most dense use when multi-functional. Confirm with each installation since this may create higher density. |
| **Min. Ceiling Ht.** | 8 ft (2.4 m) minimum. |
| **Finishes** | **Walls:** Provide a low-maintenance, durable finish.<br>**Floors:** Flooring should be sound-absorptive, durable, and easy to replace in sections.<br>**Ceiling:** Provide acoustic absorption (NRC) and light reflectance (LRV) in support of room functions and lighting. |
| **Plumbing** | None required. |
| **HVAC** | Provide system per paragraph 3-2.8. |
| **Fire Protection** | Provide system per paragraph 3-2.7. |
| **Power** | Provide outlets per paragraph 3-2.9. |
| **Lighting** | Provide system per paragraph 3-2.9. |
| **Communication** | **CCTV.** None required.<br>**CATV/Internal Video.** None required.<br>**PA/Audio.** Coordinate with installation needs, processes, and equipment.<br>**Telephone.** None required.<br>**Data.** Coordinate with installation needs, processes, and equipment.<br>**Security.** None required. |
| **Acoustics** | Meet library criteria in UFC 3-101-01 and provide an area of finishes with NRC of 0.70 or higher to equal or exceed the floor area of this room/area. |
| **Casework/Built-in Equipment** | Optional; confirm reference desk and workstations with installation. |
| **Furnishings Fixtures & Equipment (FF&E)** | Reference collections will be installation-specific and typically include lower-height book stacks, file cabinets for maps and pamphlets, and dictionary and atlas stands. |
| **User-provided Equipment** | TBD by the installation. |
| **Special Requirements** | N/A |

**Table 4-5   Reference Desk and Storage**

| Description/Usage | Areas for reference collections are composed of book stacks for reference books, computers for online catalog access, and special collections, such as microfilm. |
| --- | --- |
| **Occupancy Density** | As library, 10 per 1000 ft$^2$ (93 m$^2$). Confirm with each installation. |
| **Min. Ceiling Ht.** | 8 ft (2.4 m) minimum. |
| **Finishes** | **Walls:** Provide a low-maintenance, durable finish.<br>**Floors:** Provide durable, easy-to-clean flooring that can withstand heavy storage shelves.<br>**Ceiling:** Provide acoustic absorption (NRC) and light reflectance (LRV) in support of room functions and lighting. |
| **Plumbing** | None required. |
| **HVAC** | Provide system per paragraph 3-2.8. |
| **Fire Protection** | Provide systems per paragraph 3-2.7. |
| **Power** | Provide outlets per paragraph 3-2.9. |
| **Lighting** | Provide system per paragraph 3-2.9. |
| **Communication** | **CCTV.** None required.<br>**CATV/Internal Video.** None required.<br>**PA/Audio.** Coordinate with installation needs, processes, and equipment.<br>**Telephone.** None required.<br>**Data.** Coordinate with installation needs, processes, and equipment.<br>**Security.** None required. |
| **Acoustics** | Meet library criteria in UFC 3-101-01 and provide an area of finishes with NRC of 0.70 or higher to equal or exceed the floor area of this room/area. |
| **Casework/Built-in Equipment** | Optional; confirm reference desk and workstations with installation. |
| **Furnishings Fixtures & Equipment (FF&E)** | Reference collections will be installation-specific and typically include lower-height book stacks. |
| **User-provided Equipment** | TBD by the installation. |
| **Special Requirements** | Optional; confirm reference desk and workstations with installation. |

## Table 4-6   Study/Huddle Rooms

| Description/Usage | Small group study areas may consist of enclosed rooms and small tables with chairs located in open, but secluded, areas. |
|---|---|
| **Occupancy Density** | As conference room, 50 per 1000 ft$^2$ (93 m$^2$). Confirm with study seats, which may create higher density. |
| **Min. Ceiling Ht.** | 9 ft (2.7 m) minimum. |
| **Finishes** | **Walls:** Provide a low-maintenance, durable finish.<br>**Floors:** Flooring should be sound absorptive, durable, and easy to replace in sections or maintain.<br>**Ceiling:** Provide acoustic absorption (NRC) and light reflectance (LRV) in support of room functions and lighting. |
| **Plumbing** | None required. |
| **HVAC** | Provide system per paragraph 3-2.8. |
| **Fire Protection** | Provide system per paragraph 3-2.7. |
| **Power** | Provide outlets per paragraph 3-2.9. |
| **Lighting** | Provide systems per paragraph 3-2.9. |
| **Communication** | **CCTV.** None required.<br>**CATV/Internal Video.** None required.<br>**PA/Audio.** Coordinate with installation needs, processes, and equipment.<br>**Telephone.** None required.<br>**Data.** Coordinate with installation needs, processes, and equipment.<br>**Security.** None required. |
| **Acoustics** | Meet conference room criteria in UFC 3-101-01 and provide an area of finishes with NRC of 0.70 or higher to equal or exceed the floor area of this room/area. |
| **Casework/Built-in Equipment** | Optional study booth or table. |
| **Furnishings Fixtures & Equipment (FF&E)** | Study chairs and accessories, study table if not built-in, white board and tray, and clock. |
| **User-provided Equipment** | TBD by the installation. |
| **Special Requirements** | N/A |

## Table 4-7   Teen Area

| Description/Usage | Provide a dedicated space within the public services area for teen audiences and special interest collections for fiction, non-fiction, paperback books, and audio books. |
|---|---|
| **Occupancy Density** | As library to conference/meeting, 10 to 50 per 1000 ft$^2$ (93 m$^2$) or as most dense use when multi-functional. Confirm with reading stations and study/activity seats which may create higher density. |
| **Min. Ceiling Ht.** | 9 ft (2.7 m) minimum. |
| **Finishes** | **Walls.** Provide a low-maintenance, durable finish.<br>**Floors:** Flooring should be sound-absorptive, durable, and easy to replace in sections.<br>**Ceiling:** Provide acoustic absorption (NRC) and light reflectance (LRV) in support of room functions and lighting. |
| **Plumbing** | None required. |
| **HVAC** | Provide system per paragraph 3-2.8. |
| **Fire Protection** | Provide system per paragraph 3-2.7. |
| **Power** | Provide outlets per paragraph 3-2.9. |
| **Lighting** | Provide system per paragraph 3-2.9. |
| **Communication** | **CCTV.** None required.<br>**CATV/Internal Video.** None required.<br>**PA/Audio.** None required.<br>**Telephone.** None required.<br>**Data.** Coordinate with installation needs, processes, and equipment.<br>**Security.** None required. |
| **Acoustics** | Meet library criteria in UFC 3-101-01 and provide an area of finishes with NRC of 0.70 or higher to equal or exceed the floor area of this room/area. |
| **Casework/Built-in Equipment** | Seating and tabletops optional for minor reading areas (or FF&E). |
| **Furnishings Fixtures & Equipment (FF&E)** | Seating, tables, and activity support furniture should be mobile and multi-function. |
| **User-provided Equipment** | TBD by the installation. |
| **Special Requirements** | Multi-use space and multi-function amenities. |

**Table 4-8   Community Technology Room**

| Description/Usage | Space dedicated for equipment or technology-based crafting, art, and individual project production. Often called "maker space." |
|---|---|
| **Occupancy Density** | 20 to 25 per 1000 ft$^2$ (93 m$^2$) as wood/metal shop or computer lab. Confirm with workstations and/or classroom seats, which may create higher density. |
| **Min. Ceiling Ht.** | 9 ft (2.7 m) minimum. |
| **Finishes** | **Walls:** Provide a low-maintenance, durable finish. Coordinate with equipment in the room for appropriate finishes that can withstand the function of the room. <br><br>**Floors:** Flooring should be durable, easy to clean, and abuse-resistant. <br><br>**Ceiling:** Ceiling should be durable, cleanable, and give maintenance staff and equipment installers access to systems above. Provide acoustic absorption (NRC) and light reflectance (LRV) in support of room functions and lighting. |
| **Plumbing** | None required. |
| **HVAC** | Provide system per paragraph 3-2.8. |
| **Fire Protection** | Provide system per paragraph 3-2.7. |
| **Power** | Provide outlets per paragraph 3-2.9. |
| **Lighting** | Provide system per paragraph 3-2.9. |
| **Communication** | **CCTV.** None required. <br><br>**CATV/Internal Video.** None required. <br><br>**PA/Audio.** Coordinate with installation needs, processes, and equipment. <br><br>**Telephone.** None required. <br><br>**Data.** Coordinate with installation needs, processes, and equipment. <br><br>**Security.** Coordinate with installation needs, processes, and equipment. |
| **Acoustics** | Meet library criteria in UFC 3-101-01 and provide an area of finishes with NRC of 0.70 or higher to equal or exceed the floor area of this room/area. |
| **Casework/Built-in Equipment** | Coordinate to support maker equipment and tools planned by installation. |
| **Furnishings Fixtures & Equipment (FF&E)** | Coordinate to support maker equipment and tools planned by installation. |

| **User-provided Equipment** | Coordinate with installation for maker equipment and tools. Task lighting. |
| --- | --- |
| **Special Requirements** | Confirm ventilation, plumbing, power and security with equipment and tools planned by installation. |

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## APPENDIX A BEST PRACTICES

The Best Practices Appendix is considered to be guidance and not requirements. Its main purpose is to communicate proven facility solutions, systems, and lessons learned, but may not be the only solution to meet the requirement.

### A-1          GENERAL.

The architectural design and construction industry has produced a number of strategies for coordination, lean project design, or integrated project delivery. The following paragraphs identify good design practices for libraries. The designer is expected to interpret this guidance and configure the design for the needs of the project.

### A-1.1          Active Design.

Design for active occupants to encourage circulation or make the stairs a prominent feature in the building (if multi-story); encourage physical activity within the building.

### A-1.2          Acoustic Control.

Acoustic modeling and testing are best practices but may not match the budget or schedule of library projects. Teams should consider the extent of acoustic control, design, testing, and mitigation to best serve the project.

### A-1.3          Adaptability for Technology.

Modular flooring should be used where appropriate. Underfloor air distribution (UAD) and power access can be combined for advantage in layout flexibility and improved comfort, and is very effective for cable management. UAD systems not only allow fresh conditioned air to be delivered near the occupants, but also provides an opportunity for occupants to have control over this air flow. This is advantageous for multi-purpose and administration type spaces. However, stack shelves and collection spaces with additional structural requirements and that do not benefit from layout flexibility are not appropriate for UAD or power access floor. Refer to UFGS 09 69 13, *Rigid Grid Access Flooring*, for system criteria, requirements, and considerations. The same floor system and construction providing both air and cabling systems are similar, reducing the construction costs associated with conventional practices of separating overhead air and standard methods of cable management.

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## APPENDIX B GLOSSARY

| | |
|---|---|
| **A/E** | Architect/Engineer |
| **A/V** | Audio/Visual |
| **ABA** | Architectural Barriers Act |
| **AFI** | Air Force Instruction |
| **AFMAN** | Air Force Manual |
| **AHJ** | Authority Having Jurisdiction |
| **ANSI** | American National Standards Institute |
| **ASHRAE** | American Society of Heating, Refrigeration and Air Conditioning Engineers |
| **AT/FP** | Antiterrorism/Force Protection |
| **BEC** | Base Education Center or Learning Center |
| **CATV** | Cable Television |
| **CCTV** | Closed Circuit Television |
| **DoD** | Department of Defense |
| **DoDI** | Department of Defense Instruction |
| **FF&E** | Furnishings Fixtures & Equipment |
| **ft** | Foot |
| **ft$^2$** | Square Foot |
| **HVAC** | Heating, Ventilating, and Air Conditioning |
| **ILS** | Integrated Library System |
| **IT** | Information Technology |
| **LRV** | Light Reflectance Value |
| **m** | Meter |
| **m$^2$** | Square Meter |
| **mm** | Millimeter |

| **NARA** | National Archives and Records Administration |
|---|---|
| **NFPA** | National Fire Protection Association |
| **NISO** | National Information Standards Organization |
| **NRC** | Noise Reduction Coefficient |
| **OCONUS** | Outside Continental United States |
| **OPAC** | Online Public Access Catalog |
| **PA** | Public Address |
| **RFID** | Radio-frequency Identification |
| **TBD** | To Be Determined |
| **UFC** | Unified Facilities Criteria |
| **UFGS** | Unified Facilities Guide Specification |
| **WBDG** | Whole Building Design Guide |

# APPENDIX C REFERENCES

**C-1        GOVERNMENT.**

**DEPARTMENT OF DEFENSE (DOD)**

DoDI 1015.10, *Military Morale, Welfare, and Recreation (MWR) Programs*, Enclosure 10, https://www.esd.whs.mil/directives/issuances/dodi/

**AIR FORCE**

https://www.e-publishing.af.mil/

AFMAN 32-1084, *Standard Facility Requirements*, CC 740675 Base Libraries 7416

**NAVY**

OPNAV M-5100.23, *Navy Safety and Occupational Health Manual,* https://www.secnav.navy.mil/doni/manuals-opnav.aspx

**UNIFIED FACILITIES CRITERIA**

https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc

UFC 1-200-01, *DoD Building Code*

UFC 1-200-02, *High Performance and Sustainable Building Requirements*

UFC 3-101-01, *Architecture*

UFC 3-120-10, *Interior Design*

UFC 3-201-01, *Civil Engineering*

UFC 3-201-02, *Landscape Architecture*

UFC 3-210-10, *Low Impact Development*

UFC 3-220-01, *Geotechnical Engineering*

UFC 3-301-01, *Structural Engineering*

UFC 3-410-01, *Design: Heating, Ventilating, and Air Conditioning Systems*

UFC 3-410-02, *Direct Digital Control for HVAC and Other Building Control Systems*

UFC 3-420-01, *Plumbing Systems*

UFC 3-520-01, *Interior Electrical Systems*

UFC 3-530-01, *Interior and Exterior Lighting Systems and Controls*

UFC 3-580-01, *Telecommunications Interior Infrastructure Planning and Design*

UFC 3-600-01, *Fire Protection Engineering for Facilities*

UFC 3-601-02, *Fire Protection Systems Inspection, Testing, and Maintenance*

UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*

UFC 4-010-06, *Cybersecurity of Facility-Related Control Systems*

UFC 4-022-01, *Security Engineering: Entry Control Facilities / Access Control Points*

UFC 4-023-10, *Safe Havens*

UFC 4-026-01, *Design to Resist Forced Entry*

FC 4-760-10N, *Navy Museums and Historic Resource Facilities*

**UNIFIED FACILITIES GUIDE SPECIFICATIONS**

https://www.wbdg.org/ffc/dod/unified-facilities-guide-specifications-ufgs

UFGS 09 69 13, *Rigid Grid Access Flooring*

**FEDERAL HIGHWAY ADMINISTRATION**

*Manual on Uniform Traffic Control Devices for Streets and Highways*, https://mutcd.fhwa.dot.gov/

**INTERNATIONAL TRADE ADMINISTRATION (ITA)**

Electric Current Worldwide, https://legacy.trade.gov/mas/ian/ECW/index.html

**NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)**

NARA 1571, *Archival Storage Standards*, https://www.archives.gov/foia/directives/nara1571

**UNITED STATES ACCESS BOARD**

Architectural Barriers Act (ABA) Accessibility Standards, https://www.access-board.gov/aba/

**C-2          NON-GOVERNMENT.**

**AMERICAN LIBRARY ASSOCIATION (ALA)**

Facilities, https://www.ala.org/pla/resources/tools/directors-managers-administrators/facilities

**AMERICAN SOCIETY OF HEATING AND REFRIGERATION ENGINEERS (ASHRAE)**

https://www.ashrae.org/

ASHRAE Standard 55, *Thermal Environmental Conditions for Human Occupancy*

**INTERNATIONAL CODE COUNCIL (ICC)**

http://www.iccsafe.org

International Building Code (IBC)

International Mechanical Code (IMC)

**NATIONAL FIRE PROTECTION ASSOCIATION**

http://www.nfpa.org

NFPA 70, *National Electric Code*

NFPA 101, *Life Safety Code*

**NATIONAL INFORMATION STANDARDS ORGANIZATION (NISO)**

http://www.niso.org/

NISO TR01-1995, *Environmental Guidelines for the Storage of Paper Records*

ANSI/NISO Z39.73-1994 (R2012), *Single-Tier Steel Bracket Library Shelving*

**SOCIETY OF AMERICAN ARCHIVISTS (SAA)**

Standards Portal, https://www2.archivists.org/standards

**WHOLE BUILDING DESIGN GUIDE (WBDG)**

Design Objectives, https://www.wbdg.org/design-objectives/productive