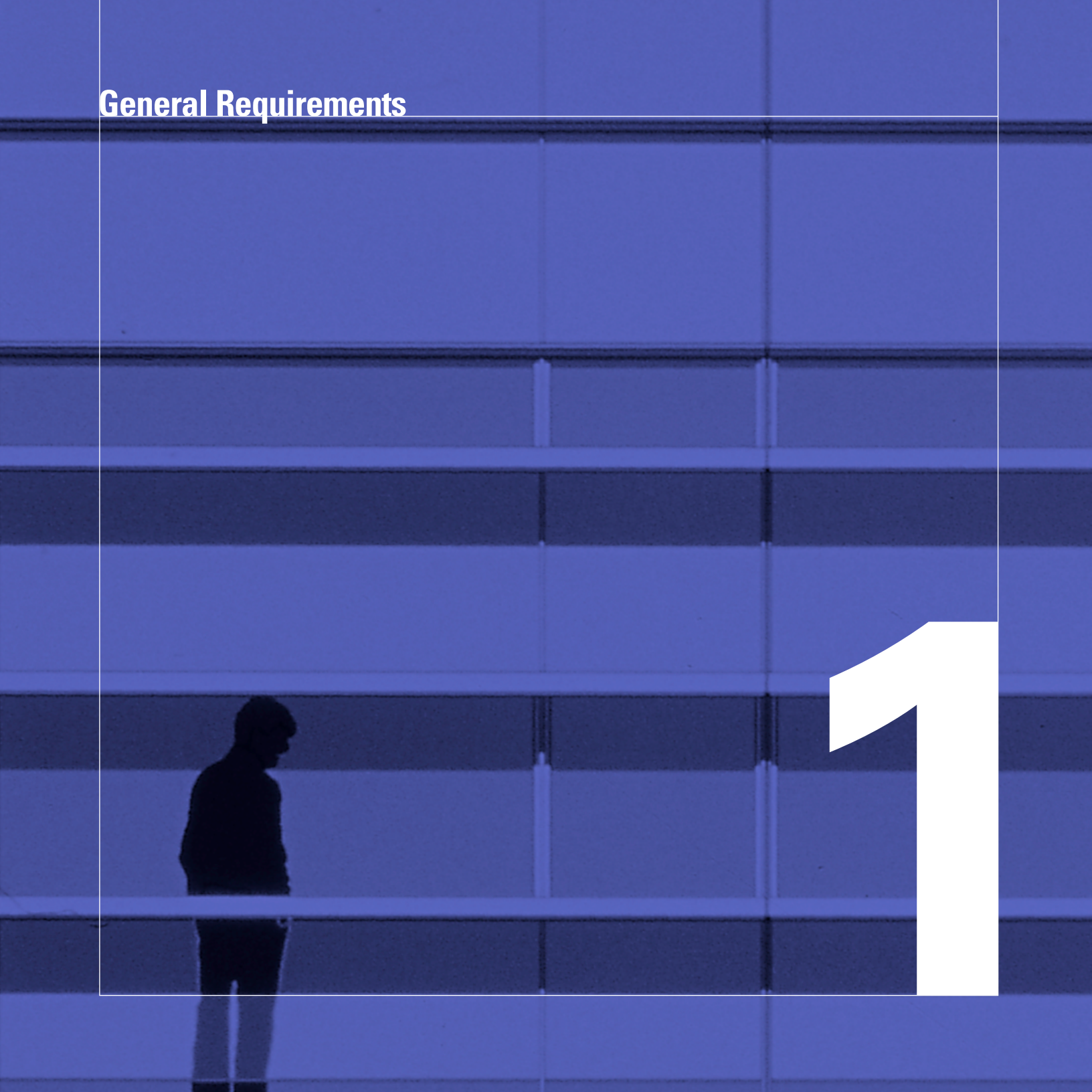
General Requirements



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1.0 TABLE OF CONTENTS

The *Facilities Standards* and other design standards are also located on the Internet at www.gsa.gov/pbs/pc/tc_files/tech_1.htm

1.1 Purpose of the Facilities Standards for the Public Buildings Service

The *Facilities Standards for the Public Buildings Service* establishes design standards and criteria for new buildings, major and minor alterations, and work in historic structures for the Public Buildings Service (PBS) of the General Services Administration (GSA). This document applies to all new facilities or alterations for GSA owned or lease construction, and contains policy and technical criteria to be used in the programming, design, and documentation of GSA buildings. It is intended to be a building standard; it is not a textbook, handbook, training manual or substitute for the technical competence expected of a design or construction professional.

The *Facilities Standards* shall be used in conjunction with the specific building program for each project, which delineates all project information, such as number and sizes of building spaces, and requirements for mechanical, electrical and other operating systems. It is imperative that each building be designed so that all components comprise an integrated solution, so that operation of the facility, energy usage and other criteria may be maximized.

Since the *Facilities Standards* contain general criteria, there may sometimes be conflicts between the *Facilities Standards* and specific project requirements. The Office of the Chief Architect, Public Buildings Service, General Services Administration, Washington, DC 20405, (202) 501-1888, may be contacted for clarification of any particular requirement.

The provisions of this document are not intended to prohibit the use of alternative systems, methods, or devices not specifically prescribed by this document, provided GSA has approved such alternatives. All technical documentation shall be submitted to the GSA Project Manager. The technical documentation submitted shall demonstrate that the proposed alternative design is at least equivalent or superior to the prescribed requirements in this document with regard to quality, strength, effectiveness, fire resistance, durability, and safety. It is not to be considered a waiver or deletion of a requirement, but shall be recognized as being equivalent protection and in compliance with the technical requirements of this document. The alternative system, method, or device shall be approved when the GSA technical design professional determines that the proposed alternative design is deemed equivalent or superior to the intent of the prescribed requirements of this document for the intended purpose.

U.S. Census Bureau, Bowie, MD.

1.2 General Design Philosophy

The following characterize GSA facilities:

Design Quality

GSA is committed to excellence in the design and development of its sites and buildings. For GSA, this means an integrated approach that achieves the highest quality of aesthetics in meeting the requirements of the building's users and accomplishing the mission of the Federal client agency, while at the same time delivering a building that is cost effective to maintain throughout its useful life and is a lasting architectural legacy that will serve the American people for many decades.

Most of the interaction between the Government and its citizens occurs in GSA buildings. Federal buildings express the image of the Government to the public. The Guiding Principles for Federal Architecture, written in 1962 by Senator Daniel Patrick Moynihan, then Special Assistant to the Secretary of Labor, and issued by the Kennedy Administration, embody GSA's commitment to produce quality design and construction. See Figure 1-1.

Design Excellence and Construction Excellence

The GSA Design Excellence Program was formally initiated in 1994 and the Construction Excellence Program in 1998. These programs ensure GSA's long-term commitment to excellence in public architecture, engineering, and construction. The selection of private sector architects and engineers who design GSA facilities is based foremost on their talent, creativity, and ingenuity. The entire architect/engineer (A/E) design team must demonstrate its ability to satisfy the comprehensive project development and management requirements of the Federal Acquisition Regulations (FAR). The Design Excellence Program incorporates peer professional in the selection of A/E design teams and the review of proposed

designs. The peer professionals are distinguished architects, engineers, landscape architects, urban designers, public arts administrators, design educators and critics from across the Nation. The main goal of the Design Excellence Program is to realize the objectives of the Guiding Principles of Federal Architecture.

The main goal of the Construction Excellence Program is to ensure that GSA's construction program delivers exceptionally well-built facilities economically, efficiently, and professionally. Like the Design Excellence Program, the Construction Excellence Program depends on a strong working relationship with the private sector design and construction community.

Flexibility and Adaptability

Federal buildings undergo many changes during their lifetime. As government missions change and priorities change, Federal agencies are created, expanded, and abolished. As a consequence, requirements for space and services change frequently, and space must be reconfigured often. The flexibility to accommodate continual change needs to be "built in" to the building design from the outset and respected in subsequent alterations. Systems flexibility is necessary in GSA buildings.

Sustainability and Energy Performance

GSA is committed to incorporating principles of sustainable design and energy efficiency into all of its building projects. Sustainable design seeks to design, construct and operate buildings to reduce negative impact on the environment and the consumption of natural resources. Sustainable design improves building performance while keeping in mind the health and comfort of building occupants. It is an integrated, synergistic approach, in which all phases of the facility lifecycle are considered. The result is an optimal balance of cost, environmental, societal and human benefits while meeting the mission and function of the intended facility or infrastructure.

Costs

It is imperative that Federal Facilities be designed with the objective of achieving lowest life cycle cost for the taxpayer. To do so, a project's design program must comprehensively define reasonable scope and performance requirements, and must match those needs to an appropriate overall budget. Consistent with programming and budgetary constraints, designed building systems/features that influence operating costs must then be analyzed and selected to achieve lowest overall life cycle cost.

Life cycle costing will always require the application of professional judgement. While life cycle cost assessments can often be based upon the merits of single system/feature comparisons, the A/E is expected to expand the analysis to include other systems/features when necessary to establish synergistic effects and first cost trade-offs. There will also be instances where involved life cycle cost elements are not well defined within the industry, defying credible inclusion with known cost impacts. In such cases, life cycle cost comparisons must be weighed with qualitative issues when making design decisions.

Operations and Building Maintenance

Systems and materials should be selected on the basis of long-term operations and maintenance costs as those costs will be significantly higher over time than first costs. The design of the facility operating systems should ensure ease and efficiency of operation and allow for easy and cost effective maintenance and repair during the facility's useful life.

The designer should obtain constant feedback from the building manager and other maintenance personnel during design. This collaboration will allow the facility to be designed with adequate understanding by both the designer and the building manager as to what is required for optimal life-cycle performance.

GSA requires detailed instructions from the designer stating the operational/maintenance procedures and design intent for all building systems. These instructions will be developed during the design phase and incorporated into the comprehensive training for operation and maintenance personnel.

Historic Buildings

The Historic Buildings program was formally initiated in 1998 as part of the Historic Buildings and the Arts Center of Expertise, established in 1997. The Historic Buildings program provides strategic and technical support to GSA business lines and regional project teams to promote the reuse, viability, and architectural design integrity of historic buildings GSA owns and leases. This mission requires GSA to be on the cutting edge in developing innovative design solutions that are affordable, extend the useful life of historic structures, and minimize the negative effects of changes needed to keep buildings safe, functional, and efficient.

The National Historic Preservation Act of 1966 mandates that Federal agencies use historic properties to the greatest extent possible and strive to rehabilitate them in a manner that preserves their architectural character, in accordance with the Secretary of the Interior's Standards for Rehabilitation. Nearly one-fourth of the space in GSA's owned inventory is in historic buildings. Regional Historic Preservation Officers coordinate external design reviews required under the Act and serve as first points of contact within each region to ensure that projects follow the Secretary's Standards while satisfying GSA's functional requirements.

Principal goals of the Historic Buildings program are to realize the objectives of the National Historic Preservation Act by: a) developing strategies that enable reuse of GSA's historic buildings and reuse of historic buildings and b) developing creative design solutions to resolve conflicts between preservation, codes, and functional requirements of modern office use. The program depends on the integral involvement of preservation design professionals in the A/E team throughout design development and project execution and on effective coordination between the design team, GSA preservation staff, and outside review groups.

Art-in-Architecture

GSA has a policy of incorporating fine art into the design of new Federal buildings and in major repair and alterations of existing Federal buildings. One half of one percent of the estimated construction cost is reserved for commissioning works by living artists. These works are acquired through a commissioning process that involves public participation by art professionals, community representatives (including the primary client), and the architect of the building. The A/E team has a responsibility to work with GSA to ensure that the art is an integral component of the building.

Urban Design and Community Development

GSA is committed to maximizing the returns on its Federal real estate investment and to leveraging its investments in ways that support communities, wherever possible. Collaboration with local officials, neighboring property owners, residents, and appropriate interest groups is essential to shape the project in ways that provide positive benefits to the surrounding neighborhood and community.

Project teams should seek out potential issues and collaborate with local partners to solve them. Aggressive identification of issues and opportunities is necessary to minimize project risk and delay, strategize the long term use and maintenance of the facility, maximize the project's positive impact on the community, and bring local resources to bear on delivering the best final product to GSA clients. Issues of common interest, such as facility location, architectural and urban design, parking, transportation, and security provide significant opportunities to work to address issues. Partners should include not only city officials but other entities with relevant knowledge, concerns, or resources. Formal planning and consultation processes, such as NEPA, zoning, or Section 106, are important. But less formal planning, information sharing, and problem solving activities can be equally valuable to the project team.

First Impressions

The GSA First Impressions Program is a comprehensive, nationwide effort to improve the appearance of our public spaces. The main goal of First Impressions is to ensure that programs like GSA's Design Excellence, Construction Excellence and routine facilities repairs and alterations incorporate the interdependence between design, function and visual appeal of the buildings' common elements.

See national Web Site: www.gsa.gov/pbs/firstimpressions

Integrated Workplace/Productivity

To provide physical work environments that will enhance work flow, GSA uses the concept of the Integrated Workplace. As defined by Franklin Becker of Cornell University and Michael Joroff of the Massachusetts Institute of Technology:

It is a system that creatively combines wisdom about the nature of physical settings (where the work is conducted); the information technologies used in the performance of work (how data, opinions, and ideas are accessed, processed, and communicated); the nature of work patterns and processes (when and how tasks must be performed to achieve business objectives); and finally organizational culture and management (the formal and informal values, exceptions, policies, and behaviors that influence all the other factors).

Productivity (individual and group performance) is greatly affected by the working environment. GSA strives to provide workplace environments that physically and psychologically enhance work performance.

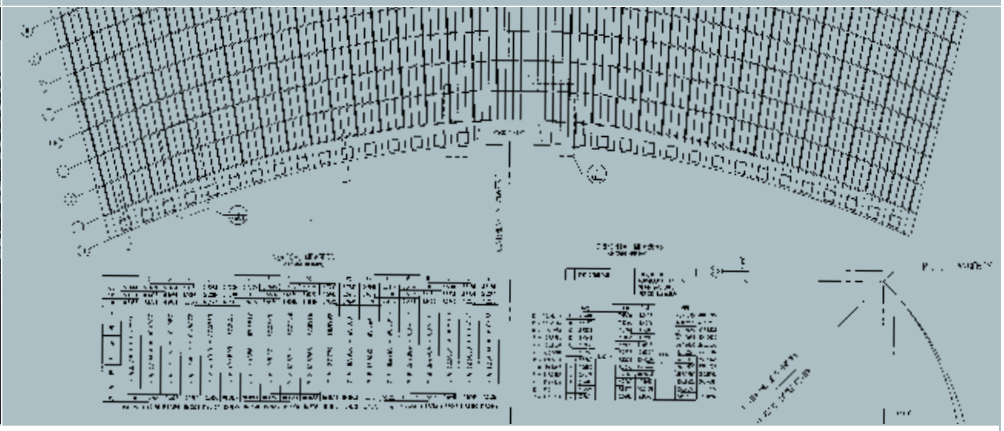
Figure 1-1 Guiding Principles for Federal Architecture

In the course of its consideration of the general subject of Federal office space, the committee has given some thought to the need for a set of principles which will guide the Government in the choice of design for Federal buildings. The committee takes it to be a matter of general understanding that the economy and suitability of Federal office design space derive directly from the architectural design. The belief that good design is optional, or in some way separate from the question of the provision of office space itself, does not bear scrutiny, and in fact invites the least efficient use of public money.

The design of Federal office buildings, particularly those to be located in the nation's capital, must meet a two-fold requirement. First, it must provide efficient and economical facilities for the use of Government agencies. Second, it must provide visual testimony to the dignity, enterprise, vigor and stability of the American Government.

It should be our object to meet the test of Pericles' evocation to the Athenians, which the President commended to the Massachusetts legislature in his address of January 9, 1961: "We do not imitate – for we are a model to others."

The committee is also of the opinion that the Federal Government, no less than other public and private organizations concerned with the construction of new buildings, should take advantage of the increasingly fruitful collaboration between architecture and the fine arts. With these objects in view, the committee recommends a three point architectural policy for the Federal Government.



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The policy shall be to provide requisite and adequate facilities in an architectural style and form which is distinguished and which will reflect the dignity, enterprise, vigor and stability of the American National Government. Major emphasis should be placed on the choice of designs that embody the finest contemporary American architectural thought. Specific attention should be paid to the possibilities of incorporating into such designs qualities which reflect the regional architectural traditions of that part of the Nation in which buildings are located. Where appropriate, fine art should be incorporated in the designs, with emphasis on the work of living American artists. Designs shall adhere to sound construction practice and utilize materials, methods and equipment of proven dependability. Buildings shall be economical to build, operate and maintain, and should be accessible to the handicapped.

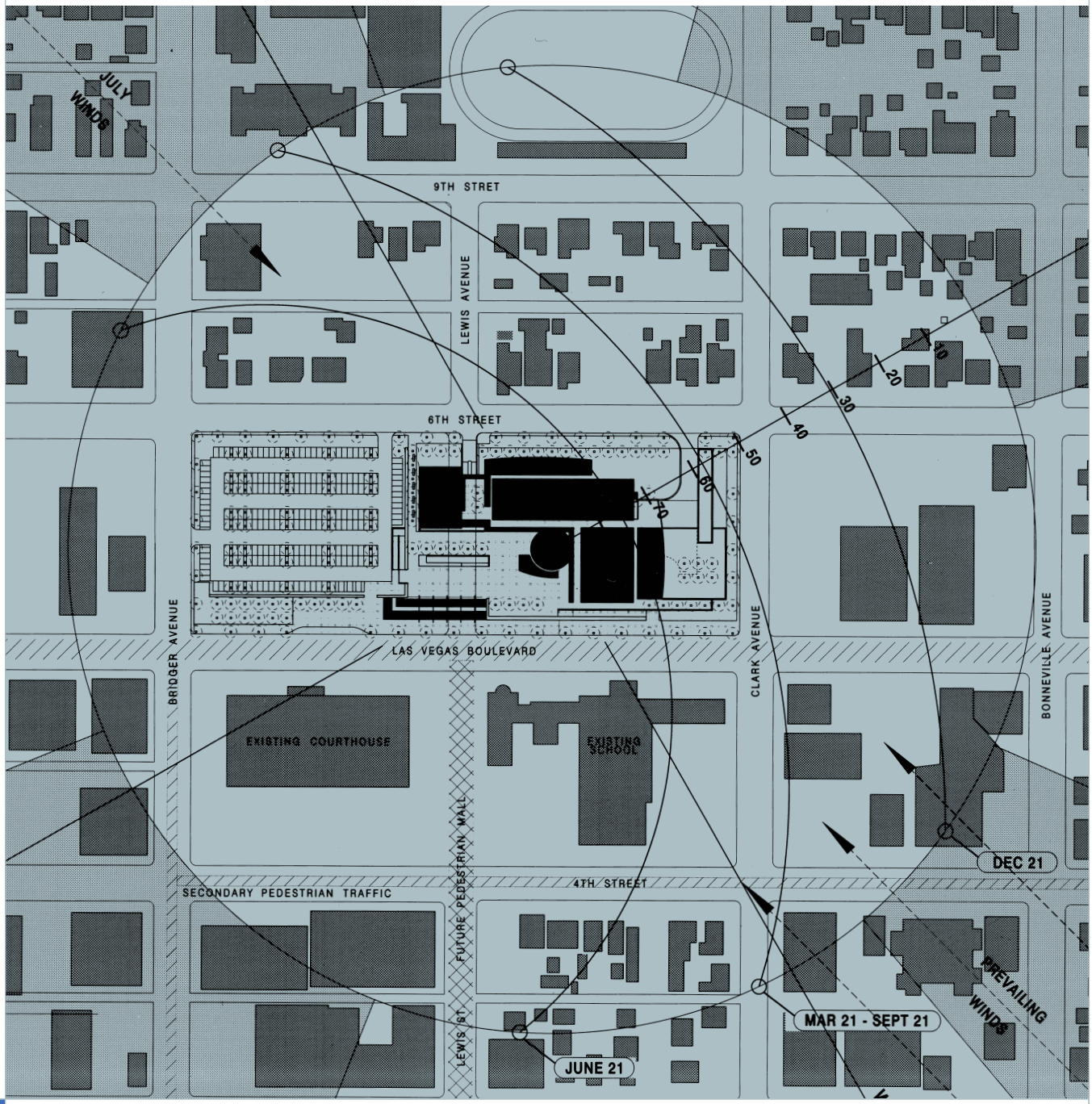
2

The development of an official style must be avoided. Design must flow from the architectural profession to the Government, and not vice versa. The Government should be willing to pay some additional cost to avoid excessive uniformity in design of Federal buildings. Competitions for the design of Federal buildings may be held where appropriate. The advice of distinguished architects, as a rule, ought to be sought prior to the award of important design contracts.

3

The choice and development of the building site should be considered the first step of the design process. This choice should be made in cooperation with local agencies. Special attention should be paid to the general ensemble of streets and public places of which Federal buildings will form a part. Where possible, buildings should be located so as to permit a generous development of landscape.

— Daniel Patrick Moynihan


JULY WINDS
9TH STRET
LEWIS AVENUE
6TH STREET
10
20
30
40
50
60
70
BRIDGER AVENUE
LAS VEGAS BOULEVARD
CLARK AVENUE
BONNEVILLE AVENUE
EXISTING COURTHOUSE
EXISTING SCHOOL
DEC 21
SECONDARY PEDESTRIAN TRAFFIC
4TH STREET
FUTURE PEDESTRIAN MALL
LEWIS ST.
PREVAILING WINDS
MAR 21 - SEPT 21
JUNE 21

1.3 Codes and Standards

National Codes. The Public Buildings Amendments of 1988, Public Law 100-678, section 21, requires that for new construction and renovation projects, GSA shall, to the maximum extent feasible, be in compliance with one of the nationally recognized model building codes and with other applicable nationally recognized codes. The following national building codes applied.

- Uniform Building Code (UBC), maintained by the International Conference of Building Officials www.icbo.org/
- National Building Code (BOCA), maintained by the Building Officials and Code Administrators www.bocai.org/
- Standard Building Code (SBC), maintained by the Southern Building Code Congress International www.sbcci.org/
- International Building Code (IBC), maintained by the International Code Counsel www.intlcode.org/

As directed by the GSA Project Manager, the design shall adhere to one of the above national building codes, as further qualified herein.

Other National Codes. For all projects, the egress requirements of the National Fire Protection Association (NFPA), Life Safety Code shall apply in lieu of other code references. For all projects, the electrical requirements of the NFPA National Electric Code shall be adopted in lieu of other code references.

For all projects, the electrical requirements of the National Fire Protection Association (NFPA), National Electrical Code have been adopted by GSA in lieu of the electrical requirements of the national model building codes.

State and Local Codes. GSA recognizes that the above referenced national building codes art typically the foundation of state and local building codes. State and local codes also represent important regional interests and conditions. As such, State and Local building codes shall also be followed to the extent possible.

Code Editions. The current edition of each applicable code, in effect at the time of design contract award, shall be used throughout the project's design and construction.

Conflicts Between Codes and GSA Requirements. To ensure flexibility, it is GSA policy to make maximum use of equivalency clauses in all recognized codes. Should a conflict exist between GSA requirements and either national or state/local codes, the GSA requirement shall prevail. All code conflicts shall be brought to the attention of the GSA Project Manager for resolution.

Code Requirements for Alterations. Generally, involved building systems need only be upgraded to correct deficiencies identified by GSA, unless the entire building is being renovated. All new work is required to meet codes used within the designated GSA regional office and interpreted by GSA. If only a portion of the building is being renovated, the national model building code that is used in the specific GSA Region should be checked to see if the entire building must be brought up to compliance. Any questions or concerns should be discussed with the Project Manager.

Zoning Laws. During the planning process and development of associated environmental documentation for new construction and renovation projects, GSA shall consider all requirements (other than procedural requirements) of zoning laws and other similar laws of the State and/or local government. This includes, but is not limited to, laws relating to landscaping, open space, building setbacks, maximum height of the building, historic preservation, and aesthetic qualities of a building.

Local regulations must be followed without exception in the design of systems that have a direct impact on off-site terrain or utility systems.

With respect to the number of parking spaces, the requirements stated in the building program take precedence over zoning ordinances in all cases. Although GSA may not be able to directly compensate for displaced parking (as a result of site acquisition), the project team should seek creative alternatives and partnerships to address parking concerns brought about by GSA's development. Considerations may include shared parking facilities and strategies to encourage transit use.

In the case of leased facilities built on private land, all local zoning ordinances apply

State and Local Government Consultation, Review, and Inspections. GSA shall provide to the appropriate officials of the State and/or local governments the opportunity to review the project for zoning compliance, building code compliance, and construction inspections. This includes, but is not limited to the review of drawings and specifications, any on-site inspections, issuing building permits, and making recommendations for compliance with local regulations and compatibility with local fire fighting practices. Local jurisdictions have the option of performing construction inspections to verify code compliance. If they elect to do so, special provisions will be included in the A/E's and contractor's contracts to handle the additional requirement of coordinating their work with local authorities. However, GSA and its contractors shall not be required to pay any amount for any action taken by the State and/or local government officials to carry out their mission. Project teams should consult on the plans for the neighborhood and surrounding properties to design a building that works well and contributes to that context.

GSA shall review all recommendations made by State and/or local officials. Each recommendation shall be carefully considered based on adequacy, cost, and nationally accepted practice. However, GSA has the final authority to accept or reject any recommendation.

Legally, buildings built on Federal property are exempt from local building codes. These codes are followed, however, to the extent possible. In case of buildings developed on private land to be leased to GSA, however, the applicable local codes govern instead of the codes adopted by GSA; the developer/owner must obtain permits necessary in such cases.

Oakland Federal Building, Oakland, CA.

1.4 Guides

The *Facilities Standards* and the noted guides should be used for the following buildings:
(In case of conflict between the Facilities Standards *and a specific building guide, the guide takes precedence.)*

Metric Design Guide (PBS-PQ260)

Federal Courthouses	See also: *U.S. Courts Design Guide; U.S. Marshals Service Requirements and Specifications for Special Purpose and Support Space Manual - sections 1,2 &,3*
Border Stations	See also: *United States Border Station Design Guide (PBS – PQ130)*
Child Care Centers	See also: *Child Care Center Design Guide (PBS – P140)*
Other Building Types	*Facilities Standards* generally apply, within specific building functional requirements Libraries Warehouses Laboratories Archives Museums Others

Historic Buildings	See also: Secretary of the Interior's *Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (36 CFR67).*
Landscape	See also: local standards. Also use *American Association of Nurserymen: ANSI Z60.1* in addition as a design guide.
Security	Interagency Security Committee's *Security Design Criteria*.

Ronald Reagan Building, Washington, D.C.

1.5 Environmental Policies & Practices

GSA is committed to being a responsible environmental steward through the consideration of the environment in all our business practices, compliance with environmental laws and regulation, using environmentally beneficial products and services, and using resources in a sustainable manner.

Sustainable Design

GSA is committed to incorporating principles of sustainable design and energy efficiency into all of its building projects. Sustainable design seeks to locate, design, construct and operate buildings to reduce negative impact on the environment and the consumption of natural resources. Sustainable design improves building performance while keeping in mind the health and comfort of building occupants. It is an integrated, synergistic approach, in which all phases of the facility lifecycle are considered. The result is an optimal balance of cost, environmental, societal and human benefits while meeting the mission and function of the intended facility or infrastructure. Further information can be obtained on the Internet through the Whole Building Design Guide www.wbdg.org.

The essential principles of sustainable design and development for Federal agencies address:

- Site – Optimize site potential
- Energy – Minimize non-renewable energy consumption
- Materials – Use environmentally preferable products
- Water – Protect and conserve water
- Indoor Environmental Quality – Enhance indoor environmental quality
- Operations and Maintenance – Optimize operational and maintenance practices

These principles shall serve as the basis for planning, programming, budgeting, construction, commissioning, operation, maintenance, decommissioning of all new GSA facilities, and for major renovation and alteration of existing buildings and facilities.

LEED Certification. As a means of evaluating and measuring our green building achievements, all GSA buildings must be certified through the Leadership in Energy and Environmental Design (LEED) Green Building Rating System of the U.S. Green Building Council. Projects are encouraged to exceed basic LEED green building certification and achieve the LEED "Silver" Level.

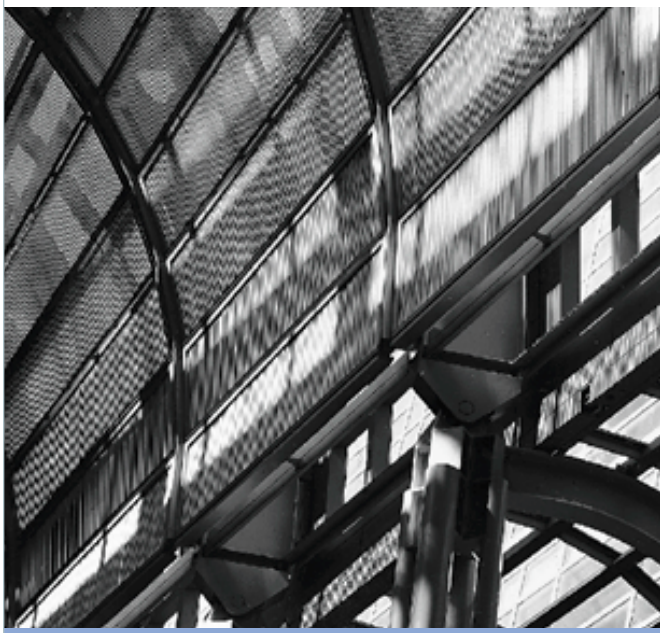
Energy Performance

By Executive Order mandate, GSA's overall building inventory has an energy performance goal of 55,000 BTU/GSF/year. For new construction, GSA must achieve better energy performance. Therefore, each new facility shall have specific energy targets (BTU/GSF/ year) as established by the Office of the Chief Architect. The A/E shall design to these targets.

Building Materials

Prohibited Materials. The use of the following materials is prohibited on all GSA projects:

- Products containing asbestos.
- Products containing urea formaldehyde.
- Products containing polychlorinated biphenyls.
- Products containing chlorinated fluorocarbons. (See Chapter 5 for replacements.)
- Solder or flux containing more than 0.2 percent lead and domestic water pipe or pipe fittings containing more that 8 percent lead.
- Paint containing more than 0.06 percent lead.



Ronald Reagan Building, Washington, D.C.

Recycled-Content Products. GSA is required to buy recycled-content products as designated by EPA through the Comprehensive Procurement Guidelines (CPG). Architects and engineers should always make environmentally responsible choices regarding new building materials and the disposal of discarded products. Buying recycled-content products ensures that the materials collected in recycling programs will be used again in the manufacture of new products.

Section 6002 of the Resource Conservation and Recovery Act (RCRA) requires EPA to designate products that are or can be made with recovered materials, and to recommend practices for buying these products. Once a product is designated, procuring agencies are required to purchase it with the highest recovered material content level practicable.

EPA also issues guidance on buying recycled-content products in Recovered Materials Advisory Notices (RMANs). The RMANs recommend recycled-content ranges for CPG products based on current information on commercially available recycled-content products. RMAN levels are updated as marketplace conditions change.

Architects and engineers must maximize the opportunity for contractors to bid recycled-content materials by including CPG items in the design specifications. Exceptions will only be permitted if written justification is provided when a product is not available competitively, not available within a reasonable time frame, does not meet appropriate performance standards, or is only available at an unreasonable price.

Examples of CPG construction products are included in Chapter 3, *Architectural and Interior Design*, and Chapter 4, *Structural Engineering*. Information can be obtained about EPA's list of designated products and the accompanying recycled-content recommendations on the Internet at www.epa.gov/cpg.

Lead-Based Paint. Paint will be tested for lead content when alteration or demolition requires sanding, burning, welding or scraping painted surfaces. When lead is found, implement the controls required by OSHA in 29 CFR 1926.62. Do not abate lead-based paint when a painted surface is intact and in good condition, unless required for alteration or demolition. In child care centers, test all painted surfaces for lead and abate surfaces containing lead-based paint.

Asbestos-Containing Materials. Prior to design in a facility to be renovated, a building evaluation by a qualified inspector will be performed. This evaluation will include review of inspection reports and a site inspection. If asbestos damage or the possibility of asbestos disturbance during construction activity

is discovered, one of the following four corrective actions must be taken: removal, encapsulation, enclosure or repair.

All design drawings and specifications for asbestos abatement must be produced by a qualified specialist. The guiding standards for this work are the GSA PBS IL-92-8 and OSHA and EPA regulations, in particular 29 CFR 1926.58, 40 CFR 61.140-157 and 49 CFR 171-180. In general, projects should be designed to avoid or minimize asbestos disturbance. The environmental standards will be supplied by the regional office of GSA.

All GSA construction work that disturbs asbestos must be performed using appropriate controls for the safety of workers and the public.

Regular inspection of the abatement work area and surrounding areas should be performed on behalf of GSA to protect the interests of GSA, the building occupants and the public. Such inspections should include visual and physical inspection and air monitoring by phase contrast microscopy and/or transmission electron microscopy, as appropriate. Inspections should be performed under the supervision of a Certified Industrial Hygienist, or individuals accredited under the Asbestos Hazard Emergency Response Act (AHERA) for asbestos abatement supervision.

Laboratories analyzing samples for asbestos must be accredited by the American Industrial Hygiene Association (AIHA) or the National Institute for Standards and Technology's Voluntary Laboratory Accreditation Program. Laboratories analyzing air samples by phase contrast microscopy must have demonstrated successful participation in the National Institute for Occupational Safety and Health (NIOSH) Proficiency in Analytical Testing program for asbestos.

On-site analysis by phase contrast microscopy may be performed as required, provided that the analyst is board-approved in the AIHA Asbestos Analysis Registry and provided that a quality assurance program is implemented, including recounting of a fraction of samples by a qualified laboratory. All final clearance transmission electron microscopy air samples must be analyzed in accordance with the EPA AHERA protocol in 40 CFR 763, Appendix A of subpart E.

Indoor Air Quality

All products to be incorporated into the building, including finishes and furniture, should be researched regarding characteristics of off-gassing and noxious odors that will affect indoor air quality.

Soil Contamination

The Comprehensive Environmental, Response, Compensation, and Liability Act (CERCLA or Superfund) provides authority and distributes responsibility for cleanup of contaminated soil, surface water and groundwater from inactive hazardous substance disposal sites and from hazardous substances released into the environment that facility permits do not cover. If soil or water contamination is a concern during construction of new buildings, major and minor alterations, and work in historic structures, then the EPA regulations under 40 CFR should be followed.

Underground Storage Tanks (USTs)

The EPA finalized regulations USTs in 40 CFR Parts 280 and 281. These regulations apply to all tanks containing petroleum products and hazardous substances as defined by the EPA. The regulations direct facilities to implement technical standards and corrective actions for the management of and releases from USTs. If USTs are a concern during construction of new buildings, major and minor alterations, and work in historic structures, then the EPA regulations should be followed. If a leaking UST is detected/discovered, contact EPA.

Compliance with the National Environmental Policy Act (NEPA)

GSA conducts an environmental review of each project prior to the start of design as required by the National Environmental Policy Act (NEPA). The review identifies environmental impacts and alternative courses of action that may have less impacts. The review can result in:

- A Categorical Exclusion (CATEX) from the requirement to prepare an Environmental Impact Statement (EIS),
- The preparation of an Environmental Assessment that results in a finding of No Significant Impact (FONSI),
- The preparation of an Environmental Assessment that identifies significant impacts, followed by preparation of an Environmental Impact Statement (EIS), or
- The preparation of an EIS.

If an Environmental Assessment or EIS has been prepared, it will constitute the primary guideline for environmental design issues. In those instances where GSA has committed to implementing specific mitigation measures, programmers and designers must ensure that those measures are carried out in the design.

Guidance

The following documents contain specific design requirements or may influence design decisions:

- Council of Environmental Quality (CEQ), Code of Federal Regulations (CFR) Title 40, Parts 1500 - 1508: *Regulations for Implementing the National Environmental Policy Act*.
- GSA ADM 1095.1F: *Environmental Considerations in Decision Making*.
- GSA ADM 1095.2: *Considerations of Flood Plains and Wetlands in Decision Making*.
- GSA PBS *NEPA Desk Guide*.
- Environmental Protection Agency (EPA), 10 CFR 40, 1.23, 1-4, 1-16: *Procedures for Implementing the Clean Air Act and the Federal Water Pollution Control Act*.
- EPA, 40 CFR 50: *National Primary and Secondary Ambient Air Quality Standards*.
- EPA, 40 CFR 60: *New Source Performance Standards*.
- EPA, 40 CFR 61: *National Emission Standards for Hazardous Air Pollutants*.
- EPA, 40 CFR 82: *Protection of Stratospheric Ozone*.
- EPA, 40 CFR 260-299: *Solid Wastes*.
- EPA, 40 CFR 300-399: *Superfund, Emergency Planning and Community Right-to-Know Programs*.
- EPA, 40 CFR 401-403: *Effluent Guidelines and Standards*.

1.6 Energy Conservation Standards

Performance Goals

Legislation directs the Federal Government to adhere to voluntary Commercial Energy Standards, reflected within the Code of Federal Regulations, 10-CFR 435. ASHRAE Standard 90.1-1999 meets or exceeds 10-CFR 435, and may be substituted as a reference (with exceptions in lighting system performance as addressed in Chapter 6).

Executive Order 13123 establishes a national program goal to reduce building annual energy consumption by 35 percent, using a 1985 baseline. To achieve this goal, GSA's inventory must reach a metered (boundary) annual energy consumption of approximately 55,000 BTU/GSF.

GSA's sustainability objective for LEED certification will likely be associated with trying to beat ASHRAE 90.1 energy performance by defined percentage levels, (e.g. 2 points toward certification for new construction projects with every 20% increment, and for alterations projects with every 10% increment).

GSA also fully supports the Government's Energy Star Buildings Program for its existing inventory, achieving metered consumption within the top 25% of involved building categories.

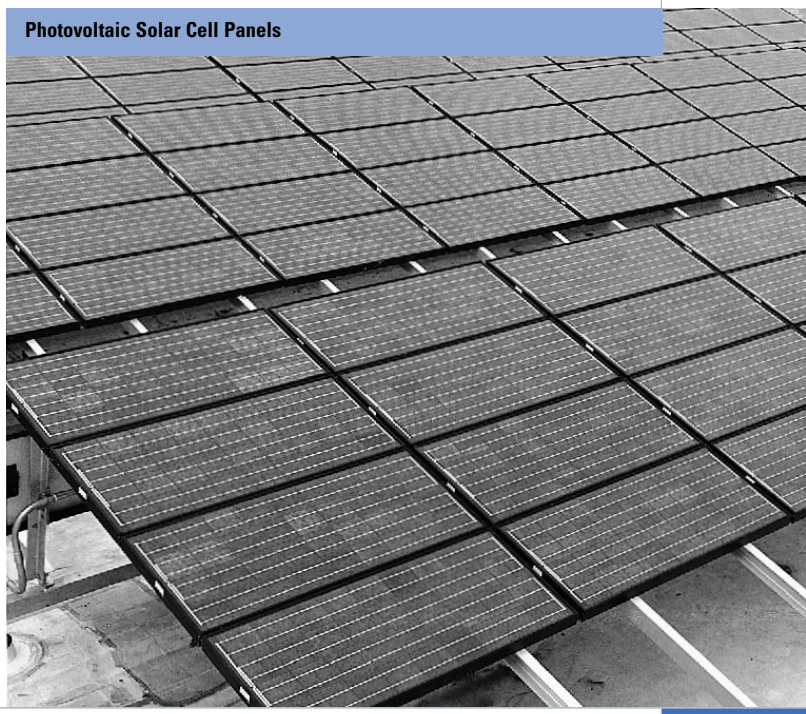
Energy Goal Applications

For New Construction and building modernizations, designs shall achieve the project's individually assigned annual energy goal, established by the Office of the Chief Architect. Generally , this goal will be below the 55,000 BTU/GSF-YR target of the above referenced Executive Order.

For new construction and building modernizations, certification shall be based upon computer simulations of the overall building's annual energy consumption. Computer programs must be approved by the Project Manager, represented by the designer as being capable of simulating weather variations, envelope heat transmission, internal load fluctuations, ventilation and air infiltration impacts, HVAC equipment part-load efficiencies, and considered control strategies.

For Major Renovation/Alterations projects, that do not involve total building modernization, involved system performance shall be certified to achieve at least a 10 percent better peak load energy efficiency, compared to ASHRAE 90.1-1999. Involved equipment efficiencies shall also be within the top 25% of manufactured product lines. Certification shall include side-by-side performance comparisons of each involved system/feature.

Photovoltaic Solar Cell Panels



1.7 Life Cycle Costing

Purpose

Life Cycle Costing (LCC) is an important economic analysis used in the selection of alternatives that impact both pending and future costs. It compares initial investment options and identifies the least cost alternatives for a twenty year period. As applied to building design energy conservation measures, the process is mandated by law and is defined in the Code of Federal Regulations (CFR), Title 10, Part 436, Subpart A: *Program Rules of the Federal Energy Management Program.*

The A/E shall contact local utility companies to determine available demand-side management programs and no-cost assistance provided by these companies to designers and owners.

Applications

Basic applications of LCC are addressed within the individual chapters herein and may be further defined within an A-E's design programming scope requirements. In general, LCC is expected to support selection of all building systems that impact energy use: thermal envelope, passive solar features, fenestration, HVAC, domestic hot water, building automation and lighting. However, LCC can also be applied to building features or involve costs related to occupant productivity, system maintenance, environmental impact and any other issue that impacts costs over time. It is very important to recognize the significance of integrated building systems design in the overall efficiency of the design.

Methodology

There are many established guidelines and computer-based tools that effectively support Present Value LCC analyses. The National Institute of Standards and Technology (NIST) has prepared the Life Cycle Costing Manual for the Federal Energy Management Program (NIST Handbook 135), and annually issues real growth Energy Price Indices and Discount Factors for Life Cycle Cost Analysis. As a companion product, NIST has also established the Building Life Cycle Cost (BLCC) computer program to perform LCC analyses. The latest versions of the BLCC program not only structure the analysis, but also includes current energy price indices and discount factor references. These NIST materials define all required LCC methodologies used in GSA design applications.

It is recommended that the A/E obtain the BLCC software and update from NIST. (The latest information on the BLCC software is available on the Internet at: www.eren.doc.gov.femp.)

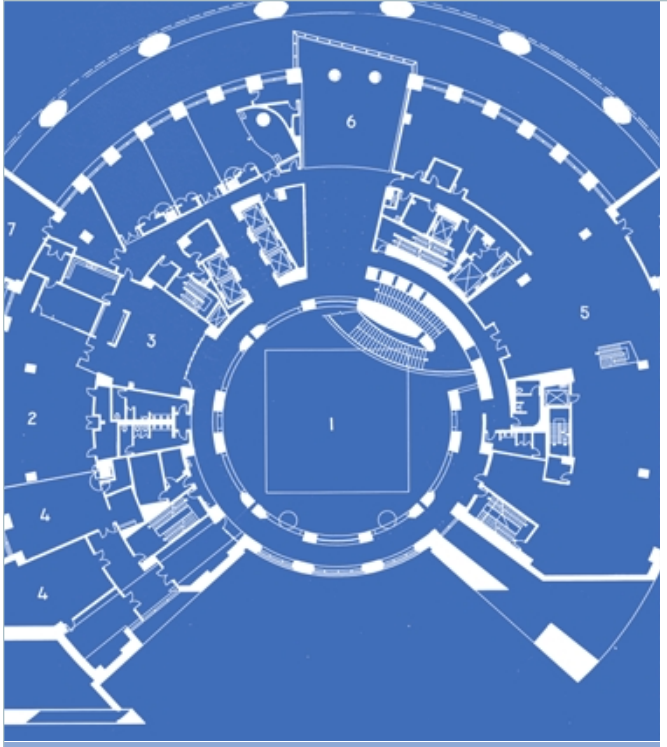
Procedures and Approach

The most effective approach to LCC is to appropriately integrate it into the design process.

The building design evolves from general concepts to detailed analysis. LCC needs to follow the same approach paralleling the focus to the current level of detail study.

It is extremely important for the effective development of the project that commitments are made and retained on the building systems, in a general sense, during the Conceptual Phase.

The building systems should be analyzed for appropriateness during the first stages of the Design Development Phase. A commitment on direction for the systems needs to be made at this time, and any further LCC studies focused on detail within each system.



Charles Evans Whittaker U.S. Courthouse, Kansas City, MO

All LCC effort should be completed in the Design Development Phase of the project.

The following practices are typically required when conducting LCC analyses for building design. They are listed here to address common concerns and frequently asked questions.

- When defining alternatives for life cycle costing, an acceptable level of overall building services must be assured throughout the analysis period.

- Design alternatives must be compared against a baseline reference alternate that is the lowest first cost of the alternatives being considered. The baseline alternate must offer a viable system, employing state-of-the-art design features, and be in compliance with all project requirements. Where existing conditions form part of the baseline alternate, the analysis must not only include intended project work, but also the additional costs necessary to achieve code compliance and reliable operation over the analysis period.

- The analysis period should be chosen to fully represent all costs. When optimizing the design of a single system, all compared alternatives must be considered over the same analysis period. Where possible, the analysis period should be the smallest whole multiple of the service lives for the major systems involved in the analysis. In any case, the analysis period should not be over 25 years unless otherwise directed by GSA.

- Costs that have already been incurred or must be incurred, regardless of the chosen alternative, can be deemed "sunk" and excluded from the analysis. Costs that must be incurred during the period from design decisions to construction award should be deemed sunk.

- Baseline and alternative first costs are typically those estimated for the construction award date. The life cycle cost analysis can assume that the award date can be considered the zero point in time for the analysis period, with all other event times referenced to the construction award date. For greater simplicity, the year of design decision can also be considered as the zero point in time, and it can be assumed that the construction award will occur in that year.

- Salvage values for alternatives are typically zero. However, in those cases where scrap values could impact decisions, the present value is calculated as its future value (scrap value) discounted back to the present from the year of occurrence. The formula for this is shown in the LCC Formulas Table 1-1.

Table 1-1
LCC Formulas

Type of Cost	Cost Examples	Present Value Relationships	Comments
Sunk	• Design Fees	Not Applicable	Costs are not included in the Analysis
First	• Investment Costs • Construction Costs	PV = TV	For those investment costs that begin at the start of the analysis period
Salvage Value	• Scrap value of equipment at the end of its service life	$PV = \frac{FV}{(1+d)^n}$ where $FV=TV(1+e)^n$	Present value equals the future value at the end of the service life, discounted by n service years
Future Investment	• One time investments occurring after the start of the analysis period • Non-Annual maintenance or repair • Major alterations to initial investment work	$PV = TV \frac{(1+e)^n}{(1+d)^n}$	Discount the future value (Today's Value escalated at rate e to year n) back to the present.
Residual Value	• Equipment with a service life extending beyond the analysis period	$PV = \frac{FV}{(1+d)^n}$	Future value equals the residual value at the end of the analysis period, discount costs to the Present Value
Annually Recurring Fixed	• Fixed payment service contracts with inflation adjustments • Preventative maintenance	PV = TV(UPW) where $UPW = \frac{(1+d)^n - 1}{d(1+d)^n}$	Annually Recurring Cost, relating to today's value, which increase in price at the same rate as general inflation. The UPVn factors are tabulated in the previously referenced NIST publication, Energy Prices and Discount Factors

Type of Cost	Cost Examples	Present Value Relationships	Comments
Annually Recurring Escalating	• Service or maintenance which involve increasing amounts of work • Frequent replacements that escalate at a rate different than inflation	PV = TV(UPW*) where $UPW^* = \dfrac{\left[\dfrac{(1+e)}{(1+d)}\right]^n - 1}{1 - \dfrac{(1+d)}{(1+e)}}$	The present value of such costs are calculated by using a modified version of the UPW formula (UPW*) which allows for cost escalation.
Energy	• Fuel related costs, such as fuel oil, natural gas or electricity	PV = TV(UPW*)	Energy related UPW* factors are found in the NIST publication and the BLCC program.
Escalation Rates	• Relating Budgetary Escalation to Real Growth Escalation	E = e + I + eI	Needed to convert budgetary assessments.

Definitions

FV = future value
PV = present value
TV = today's value
d = real discount rate
e = real growth escalation rate (the differential escalation rate that exists after removing the influence of general inflation)
n = number of years to occurrence or the analysis period, as appropriate
E = Budgetary Escalation
I = Inflation Rate
UPW = Uniform Present Worth factor for fixed recurring costs
UPW* = Modified Uniform Present Worth factor for escalating recurring costs

- Future one-time costs, such as replacement costs, are established by escalating a known today's value (using real growth rate) to its future value in the year it occurs, then discounting that value back to its present value (using a real discount rate). The formula for this is shown in the LCC Formulas Table 1-1.

- For instances where an alternative has service life beyond the analysis period, allowance shall be made for the associated residual service worth. This calculation involves identifying the future residual value at the end of the analysis period, then discounting the amount back to the present. The future residual value can be approximated by multiplying the future investment value (less future salvage value at the end of its service life) by the proportion of time remaining in the analysis period, compared to its service life.

- Annually recurring fixed costs include those costs where increases have no real growth, such as costs that increase at the general inflation rate. They can be represented by the formula shown in the LCC Formulas Table 1-1. Also in this table is the formula for recurring costs where recurring costs escalate. Both formulas involve multiplying a known cost (in today's value) by a uniform present worth value.

- Fuel costs represent a special case of recurring escalating costs. Uniform present worth values are available from NIST data, correlating specific fuel types by sector/location for a defined analysis period. For simplicity, demand charges may be assumed to escalate at the same rate as consumption charges.

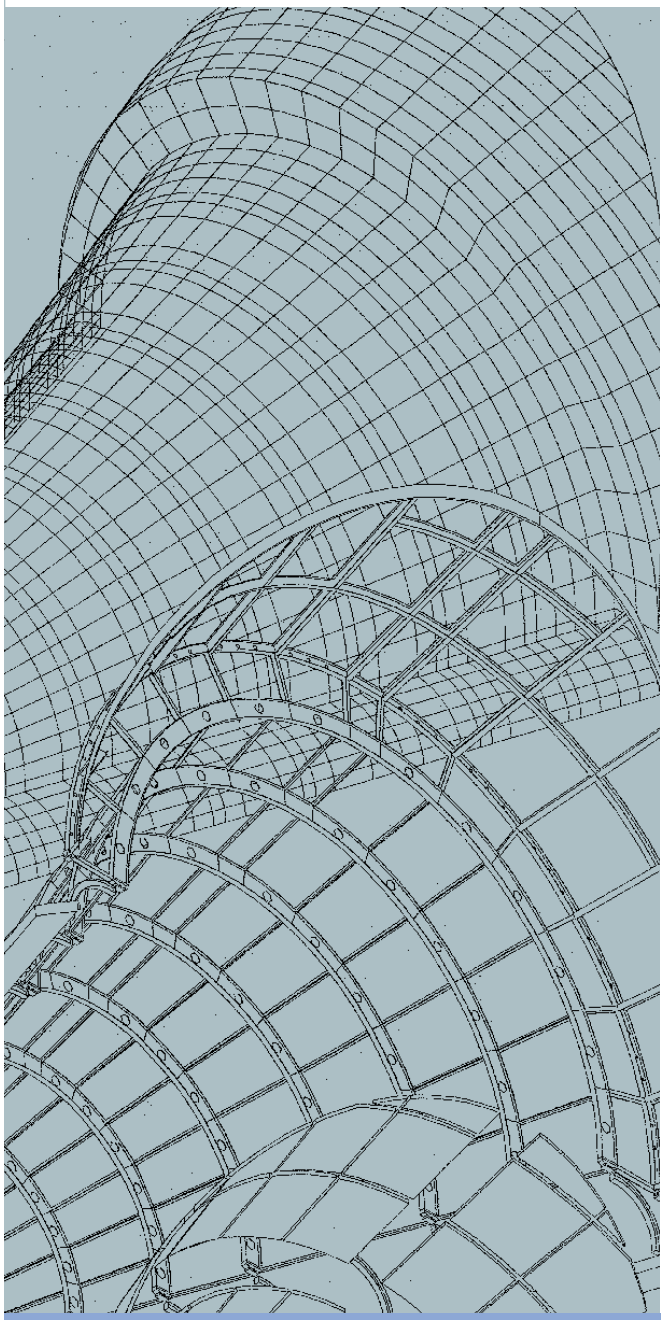
- Investment and replacement actions over time may impact recurring costs. For simplicity, unless otherwise directed, fluctuating recurring cost savings may be assumed to be proportionate to the savings realized at the start of the analysis period.

- Calculate the savings to investment ratio (SIR) for comparisons of dissimilar alternatives, such as comparing an HVAC alternative to a lighting alternative. Calculate net savings for comparisons of similar alternatives, such as optimizing insulation thickness in a wall.

- A sensitivity analysis is required whenever assumptions may be considered questionable. This simply requires conducting multiple LCC analyses using extremes of cost parameters in question.

- Due to possible margins of error in estimating costs, alternatives with a life cycle cost differential of less than 10 percent can be judged inconclusive by GSA.

- To define energy use for alternatives that are influenced by weather and/or varying loads/schedules, the modeling program DOE2 or other approved software shall be used.



Ronald Reagan Federal Building atrium skylight isometry, Washington, D.C.

1.8 Metric Standards

All projects will be produced using the International System (SI) unless otherwise directed by the Chief Architect. A project is "metric" when:

- Specifications show SI units only.
- Drawings show SI units only.
- Construction takes place in SI units only.
- Inspection occurs in SI units only.
- Cost estimating is based on SI units only.

Reference *Metric Design Guide* (PBS-PQ260).

Reinforcing Bars For concrete reinforcing bars, specify U.S. Standard Bar Number because currently there are no consistent metric standards for this product.

English and Metric Measurement Reference

Most critical dimensions set by standards and codes currently remain in the English measure system. It is the intent of GSA to support the conversion to metric. Therefore, when a dimensional requirement is stated in this document, the designated dimension by code or regulation will be placed in parenthesis and the corresponding representation in the other measurement system will be placed adjacent to it.

Example: (5′) 1.52M diameter clearance for navigation of a wheeled chair in an accessible toilet room.

Charles Evans Whittaker U.S. Courthouse, Kansas City, MO

1.9 Accessibility Design Guidelines

It is GSA policy to make all Federal buildings accessible without the use of special facilities for the disabled. The intent of this policy is to use standard building products set at prescribed heights and with prescribed maneuvering clearances to allow easy use by disabled employees and visitors. Building elements designated specifically for use by disabled persons should be kept to a minimum.

Uniform Federal Accessibility Standards (UFAS) is mandatory on all GSA projects. Current GSA policy also encourages compliance with the requirements of the Americans with Disabilities Act Accessibility Guidelines (ADAAG) where those requirements are stricter than UFAS. The A/E is responsible for checking whether there are local accessibility requirements. If they exist, the most stringent will prevail between local and UFAS/ADA.

The criteria of these standards should be considered a minimum in providing access to the physically disabled. Where dimensions for clearances are stated, allowance should be made in the design for construction tolerances to ensure the finished construction is in full compliance. (Compliance demonstration is mandatory.)

The following information lists provisions where UFAS is more stringent or contains different requirements than ADAAG. The bold type designates which standard should be used.

Federal Office Space
In office space the following two conditions apply:

a. Those where UFAS provisions are clearly more stringent than ADAAG
b. Those where differences are "de minimis," or where provisions result in an equivalent level of access, do not significantly impact accessibility, or are outdated and no longer serve the intended purpose. In these cases, GSA has the option to choose between relevant options.

Where UFAS Clearly is More Stringent:

Work Areas UFAS requires that all areas which may result in employment of physically disabled persons be accessible. ADAAG requires only that people with disabilities be able to approach, enter, and exit a work area (**UFAS 4.1.4**; ADAAG 4.1.1(3)).

Work Surface Scoping UFAS requires that 5 percent of all fixed or built-in employee work surfaces be accessible. ADAAG does not require work surfaces in work areas to be accessible. Both UFAS and ADAAG require that 5 percent of fixed tables in public or common use areas be accessible **(UFAS 4.1.2(17) and 4.32**; ADAAG 4.1.1(3) and 4.1.3(18)).

No Elevator Exception UFAS has no exception to the elevator requirement and requires elevators in all multi-story buildings and facilities. ADAAG provides an exception to the elevator requirement in certain buildings that are under three stories or have less than 3000 square feet per story **(UFAS 4.1.2(5)**; ADAAG 4.1.3(5) Exception 1).

U.S. Courthouse, White Plains, NY

Entrances in Multi-Grade Buildings UFAS requires at least one principal entrance at each grade floor level to a building to be accessible. ADAAG requires: (1) that at least 50% of all public entrances be accessible; and (2) that the number of exits required by the applicable building/ fire code be used in determining the total number of accessible entrances required in a building or facility. UFAS would require more accessible entrances in certain "multi-grade" buildings **(UFAS 4.1.2(8)**; ADAAG 4.1.3(8)).

Elevator Controls UFAS requires elevator controls to be mounted no higher than 48 inches "unless there is a substantial increase in cost," in which case 1400 mm (54 inches) is allowed. ADAAG allows 1400 mm (54 inches) whenever a parallel approach is provided **(UFAS 4.10.12(3)**; ADAAG 4.10.12(3)).

UFAS/ADAAG Differences "De Minimis"

Entrance Signage UFAS always requires the International Symbol of Accessibility (ISA) at accessible entrances. ADAAG requires the ISA at accessible entrances only when there are inaccessible building entrances in the facility. If all entrances are accessible the ISA is not required under ADAAG (UFAS 4.1.1(7); ADAAG 4.1.2(7)).

Stairs Exception UFAS exempts stairs from complying with 4.9 only if an elevator connects the same levels the stairs do. ADAAG exempts stairs from section 4.9 when there is any accessible means of vertical access connecting the same levels that are connected by the stairs (UFAS 4.1.2(4); ADAAG 4.1.3(4)).

Handrail Height UFAS requires that handrails at stairs and ramps be placed with the gripping surface between 800 mm and 900 mm (30 and 34 inches) above the surface of the stair or ramp. ADAAG requires that such gripping surfaces be placed between 900 mm and 1000 mm (34 and 38 inches) (UFAS 4.8.5(5) and 4.9.4(5); ADAAG 4.8.5(5) and 4.9.4(5)).

Tactile Warnings UFAS requires that doors to hazardous areas be equipped with tactile warnings. This provision is reserved in ADAAG (UFAS 4.1.2(14), 4.13.9, 4.29.3, 4.29.7; ADAAG 4.13.9, 4.29.3).

Pictograms UFAS requires pictogram symbols to be tactile and does not allow tactile simple serif characters. ADAAG does not require pictogram (pictorial symbols signs) to be raised and does allow the use of simple and sans serif tactile characters. UFAS only allows sans serif characters (UFAS 4.30.4; ADAAG 4.30.4).

Special Occupancies

Assembly Areas

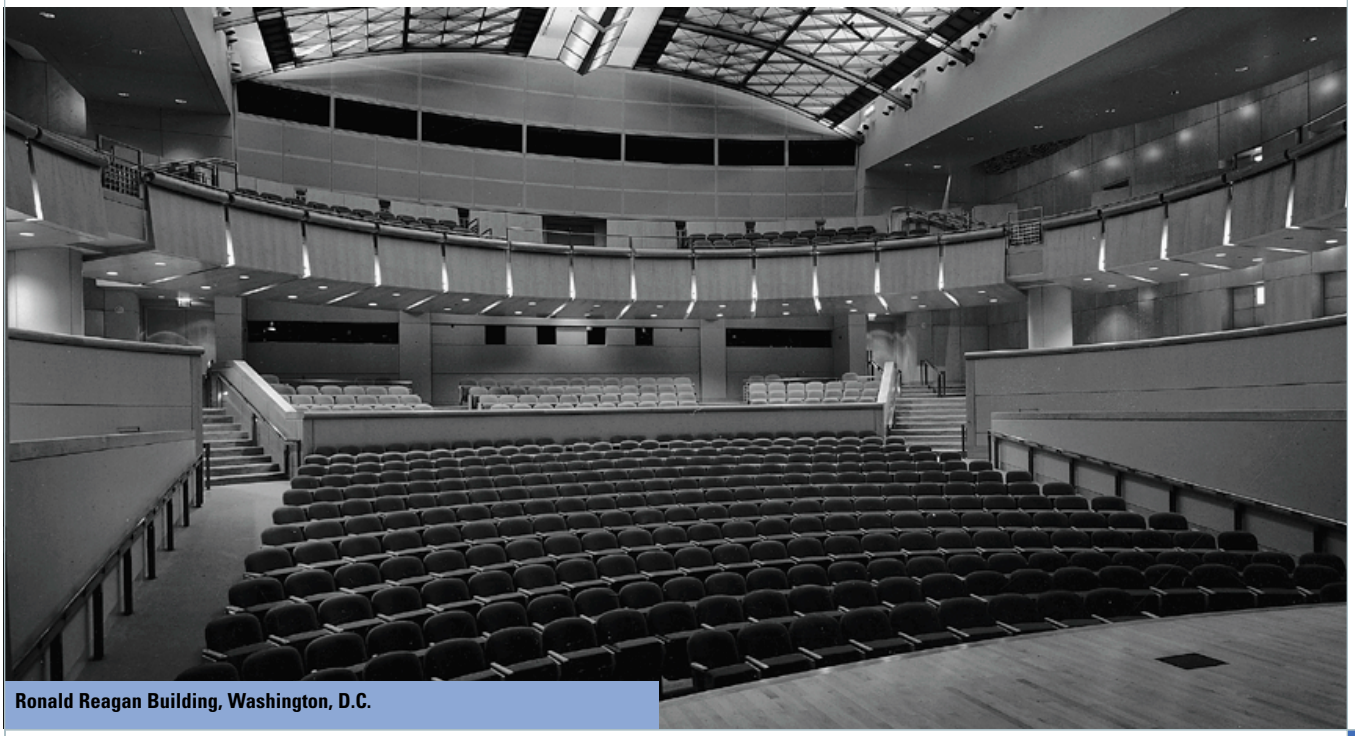
Scoping for 101 or More Fixed Seats. UFAS requires a greater number of wheelchair locations than ADAAG in larger assembly areas where the number of fixed seats exceeds 101 (UFAS 4.1.2(18); ADAAG 4.1.3(19)(a)).

Dispersion for 300 or Fewer Fixed Seats. UFAS requires that wheelchair spaces be dispersed throughout the seating area, regardless of seating capacity. ADAAG requires that wheelchair spaces be provided in more than one location when seating capacity exceeds 300 (UFAS 4.33.3; ADAAG 4.33.3).

Transient Lodging

Scoping. UFAS requires 5 percent of transient lodging facilities to be accessible to persons with mobility impairments which, in very large facilities, would result in a higher number of accessible units than ADAAG would require. As required by the ADA, ADAAG provides for an exception for facilities with five or fewer units that contain the residence of the proprietor. UFAS does not provide for such an exception (UFAS 4.1.4(11); ADAAG 9.1.1 Exception, 9.1.2).

Scoping and Technical Provisions. UFAS has scoping and technical provisions for housing. Section 13 Housing of the ADAAG interim final rule has not been adopted as a standard by the Department of Justice. The Board is considering reserving Section 13 in its entirety when the



Ronald Reagan Building, Washington, D.C.

final guidelines for State and local government facilities is issued (UFAS 4.1.1(5)(d), 4.1.4(11), 4.34; ADAAG – proposes to reserve housing).

Restaurants and Cafeterias

Table Aisles. UFAS requires that there be access aisles between tables in restaurants and cafeterias which comply with 4.3 Accessible Routes. ADAAG requires that all accessible fixed tables shall be accessible by means of an access aisle at least 900 mm (36 inches) clear between parallel edges of tables or between a wall and the table edges (UFAS 5.1; ADAAG 5.3).

Vending Machine Controls. UFAS requires that the controls and operating mechanisms of vending machines in restaurants and cafeterias comply with all of 4.27. ADAAG only requires that the spaces where vending machines are located comply with the space allowances and reach ranges requirements (UFAS 5.4; ADAAG 5.8).

Bureau of Labor Statistics

Health Care

Canopy at Passenger Loading Zone. The application of the term "Health Care buildings and facilities" in UFAS, which is not expressly defined, may require more facilities to provide a canopy or roof overhang and a passenger loading zone at their entrances. ADAAG specifically defines "Medical care facilities" which must have a roof canopy or overhang and a passenger loading zone at an accessible entrance (UFAS 6.1; ADAAG 6.1).

Patient Bed Spacing. UFAS requires that there be 900 mm (36 inches) along each side of a bed in patient bedrooms, 1200 mm (48 inches) between beds, 1100 mm (42 inches) between the foot of a bed and the wall, and 1200 mm (48 inches) between the foot of a bed and the foot of the opposing bed. UFAS separately identifies requirements for one-bed rooms, two-bed rooms, and four-bed rooms. ADAAG treats beds in all rooms the same and requires that there be 900 mm (36 inches) along each side of a bed (UFAS 6.3; ADAAG 6.3).

Mercantile

Service Counters. UFAS requires that "a portion" of service counters in mercantile facilities be between 700 mm and 860 mm (28 and 34 inches) high. ADAAG requires a 36 inch length of service counter which is a maximum of 900 mm (36 inches) high (UFAS 7.2; ADAAG 7.2).

Check-Out Counter Height. UFAS requires at least one check-out counter to be no higher than 900 mm (36 inches). ADAAG requires that a specific number of check- out counters be no higher than 970 mm (38 inches) and that the top of the lip of the counter not exceed 1000 mm (40 inches) (UFAS 7.3(2); ADAAG 7.3(2)).

Libraries

Knee Space at Check-Out Area. UFAS requires that at least one lane at each check-out area provide a counter surface that is between 700 mm and 860 mm (28 to 34 inches) high with knee clearances that is 700 mm (27 inches) high, 800 mm (30 inches) wide and 500 mm (19 inches) deep in libraries. ADAAG requires that at least one lane at each check-out area provide a 900 mm (36-inch) length of counter which is a maximum of 900 mm (36 inches) high. ADAAG does not require knee space (UFAS 8.3; ADAAG 8.3).

Postal Facilities

Customer Service Counters. UFAS requires that the aisles in front of customer service counters in postal facilities be at least 1200 mm (48 inches) wide. ADAAG requires services counters to be on an accessible route 900 mm (36 inches minimum width) (UFAS 9.2; ADAAG 7.2).

Partitions. UFAS requires that in postal facilities all fixed partitions withstand 372 kg/m (250 lb/f) from any direction. ADAAG does not have a similar provision (UFAS 9.2(1); ADAAG – no provision).

Handrails. UFAS requires that in postal facilities, where handrails are provided (regardless of whether they are required or not), the walls must be capable of supporting 372 kg/m (250 lb/f) in any direction. ADAAG requires the support only where handrails are required (UFAS 9.2(2); ADAAG 4.26.3).

Lockers. UFAS has technical requirements for lockers in postal facilities. The scoping in UFAS is vague, providing that "lockers in easily accessible areas must be provided for use by physically disabled people." ADAAG does not have a similar provision (UFAS 9.5; ADAAG – no provision).

Attendance Recording Equipment. UFAS requires that attendance recording equipment (i.e. time clocks, etc.) be mounted no higher than 1200 mm (48 inches) in postal facilities and that counter space at these check-in areas be no higher than 900 mm (36 inches) above the floor. ADAAG does not have a similar provision (UFAS 9.6; ADAAG – no provision).

Detention and Correctional Facilities

Scoping. UFAS requires 5 percent of residential units in detention and correctional facilities to be accessible. This figure is greater than the percentage proposed in Section 12 of the final rule on ADAAG for State and local government facilities (UFAS 4.1.4(9); ADAAG 12.4.1). The UFAS and ADA Title III standards do not cover clearly, nor in great detail, many of the facilities which the GSA constructs such as courthouses and detention facilities. These facilities are, however, covered in detail in the Interim Final Guidelines proposed for Title II of the ADA which apply to State and local government facilities.

Federal Courthouses

It is GSA design policy that all Federal courtroom designs have the witness stand and jury box accessible, and the judge's bench, clerks' station, etc., to be adaptable.

Additions and Alterations

UFAS is more stringent or different than ADAAG.

Additions. UFAS requires that if an addition to a building or facility does not provide an accessible route, an accessible entrance, or accessible toilet facilities, and such facilities are provided in the existing building then at least one of each shall be made accessible. ADAAG may require these items to be accessible under the path of travel obligation, depending on the amount of money required to build the addition (UFAS 4.1.5; ADAAG 4.1.5).

Substantial Alterations. UFAS requires greater accessibility when substantial alterations are made to a facility depending on the amount of money spent on the alteration and the size of the building or site. ADAAG requires that when an alteration is made to an area containing a primary function that the path of travel to that altered area and the restrooms, telephones, and drinking fountains that serve that area be made accessible unless the additional cost of doing so would be disproportionate to the overall cost and scope of the original alteration to the primary function area. The level of disproportionality is set at 20 percent of the cost of the original alteration to the primary function area (UFAS 4.1.6(3); ADAAG 4.1.6(2)).

Alterations. ADAAG provides that in alterations, the requirements of 4.1.3(9), 4.3.10 and 4.3.11 concerning egress and areas of rescue assistance do not apply. UFAS does not have a similar exception (UFAS – no exception; ADAAG 4.1.6(g)).

Both the UFAS and ADAAG references used for this comparison were current as of the date of publication. (The A/E should check all updates to the respective requirements before proceeding with the building design.)

NASA Auditorium, Washington, D.C.