Design Standards for U.S. Court Facilities

9

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Jose' V. Toledo United States Post Office and Courthouse
Old San Juan, Puerto Rico
Architect: Finegold Alexander + Associates, Inc.
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Photo: Kyle R. Brooks

9.1 Summary

The following complementary documents provide comprehensive programming and design criteria for United States Courts facilities.

- *U.S. Courts Design Guide: (USCDG)*
  Focuses on the functional program requirements; the departmental and interdepartmental adjacency relationships; finish materials; and the specific performance criteria for environmental systems including heating, cooling, and lighting. It also addresses acoustic, security, telecommunications and audio/visual design requirements.

- *Requirements and Specifications for Special Purpose and Support Space Manual including all volumes and addenda: (USMS-RSSPSSM)*
  Provides the finish criteria for USMS functional program requirements; spatial relationships; electronic/physical security plus hardware standards and special HVAC requirements within the U.S. Courts and Court-related spaces.

The USCDG includes a tabular comparison of funding responsibilities for all components of the courthouse and court functional space. (This information is organized into budget requirements for: GSA; Judiciary; and the Judiciary-Related Executive Branch Agencies.)

The USCDG and USMS-RSSPSSM speak directly to the functional requirements of the *user and tenant*. Chapter 9 presents the most cost effective and efficient building systems, and materials to achieve the appropriate environment from the perspective of the *building owner* (GSA); by reference to: applicable technical standards; security standards; life-safety and accessibility requirements.

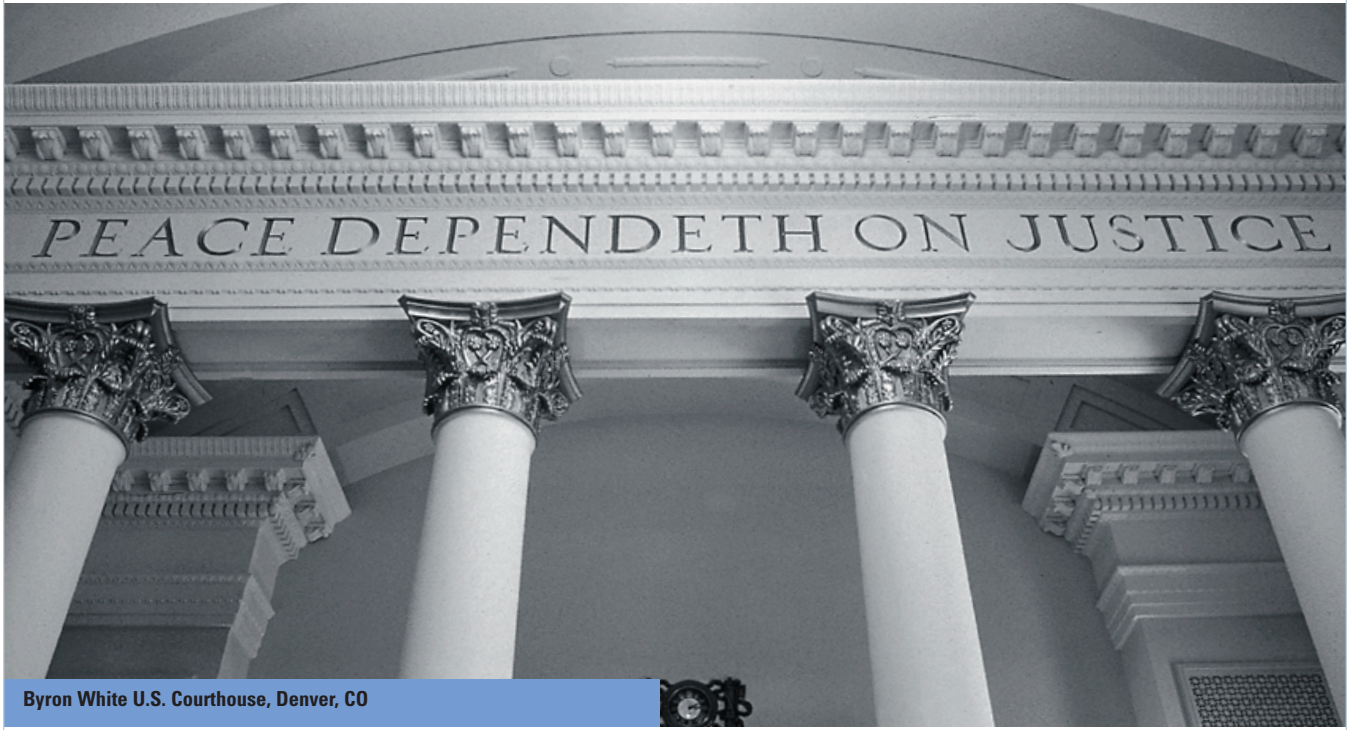
The USCDG makes reference to technical information related to performance criteria in order to help illustrate the rationale for the design requirements and to establish the standard for level of quality.

Chapter 9 refers to program and design issues in an effort to relate the design intent directly to the technical requirements for the building systems and finishes.

Chapter 9 does not cover issues related to selection of audio-visual, data, or telecommunications systems. (This criterion is developed in the *U.S. Courts Courtroom Technology Manual*.) Reference is made to these systems in Chapter 9 only with regard to the electrical service requirements in the areas where they are being installed.

Complementary documents to both the USCDG and Chapter 9 are the USMS-RSSPSSM standards. These documents establish, in detail, the environmental, security, functional, and technical requirements for the USMS spatial accommodations within U.S. courthouses. They include: information regarding secure environments for prisoners being held in preparation for a court appearance; USMS staff facilities; and general building security requirements. (The building perimeter and site specific security issues are the responsibility of the GSA.) GSA is responsible for power to the electronic security devices, but it should be understood by the design consultants that the USMS security contractor provides detailing and environmental requirements related to security within the functional area dedicated to the courts. Chapter 9 will indicate general requirements, but the USMS-RSSPSSM is the standard to follow.

9.2 General Requirements



Byron White U.S. Courthouse, Denver, CO

Planning for Future Requirements

The master plan for each courthouse facility is intended to accommodate 30 years of growth and the design of the initial phase of construction must provide the spatial requirements for the first 10 years of this plan from the start of design.

The conversion of general office or other support spaces to courtroom use will potentially put greater demands on the HVAC, electrical, and communications systems. These systems will require expansion capacity and space provided for additional equipment related to the future courts in the initial building design. Historic courthouses require special considerations. For guidance on renovation of historic courthouses, see Chapter 13 of the *U.S. Courts Design Guide*. Permanent ramps should be installed in historic buildings, unless such ramps will result in substantial loss of historic material. Under exceptional conditions, an application for a waiver may be made for a temporary ramp.

Planning for Accessibility

All U.S. Court facilities must be accessible to the physically disabled.

The detailed functional aspects of each courtroom component include an integrated reference to accessibility accommodation within the description of Courtroom Requirements in Chapter 4 of the USCDG.

The following information is intended only as a summary of the basic circulation; change in elevation; and spatial requirements to be addressed at each respective component with regard to accessibility for physically challenged individuals.

Design for accessibility should comply with the requirements of *Uniform Federal Accessibility Standards* (UFAS) and the *Americans with Disabilities Act of 1990* (ADA). The more stringent requirement between UFAS and ADA will be adopted as part of design criteria. Please refer to Chapter 1 and Appendix 1.A. for information on general compliance issues and measures in Federal building planning and design.

It is GSA and judiciary policy that all Federal courtrooms have the lectern, counsel tables, the witness stand, and jury box accessible in the original design; and the judge's bench, clerk's station, and other court personnel workstations adaptable, regardless of local or state code.

In all areas of a building used by the public, *Title II of the ADA* requires a totally accessible interior path from point of entry to all public services. The design elements affected by this requirement consist of:

- Vestibule configuration
- Door sizes and pressure of operation
- Corridor widths
- Elevator access and control
- Toilet room and stall dimensions
- Telephone and TTY (text telephone) provisions
- Drinking fountain location and dimensions
- Visual and audible alarm accommodations
- Signage design & location
- Quantity of accessible seating
- Ramps or lift access to all raised seating

Access to all raised areas in courtrooms require lifts or permanent ramps. If lifts are provided, lifts must be an integral part of the architecture of the courtroom. Bench areas will be designed to accommodate this equipment including structural slabs with a shallow pit for the lift platform.

U.S. Court facilities have several conditions that are unique to Federal building planning and design. These include provisions within the courtroom for fixed millwork to include elevated platforms for judges, witnesses, clerk staff, reporters, and jurors. In addition, design of spectator seating areas must consider physically challenged visitors including individuals with sight and hearing difficulties. (All areas of the Courtrooms must accommodate listening systems for the hearing impaired; and translators, notetakers, interpreters for the visually disabled.)

Table 9-1 outlines the accessible standards that apply specifically to courts and highlight instances where policy or preferences developed by GSA, in conjunction with the Judicial Conference of the United States, differ from UFAS or the ADA. If an ADA standard takes priority or must be considered in addition to UFAS, it is noted accordingly by the designation (ADA). Adaptability requires that dimensional consideration has been included in the original design to incorporate accessible elements at a later time. Wherever ramps or lifts are provided for access to a raised area, railings must be provided as required.

Infrastructure

Electrical outlets, wiring, conduit, or raceways to support sound and visual communication equipment for persons with disabilities shall be provided by GSA. Electrical service may be required for: transcription services, telephone handset amplifiers, telephones compatible with hearing aids, closed caption decoders, text telephones (TTYs) or other devices to assist those with hearing or visual impairments.

Acoustic Planning Requirements

The Project Design Team will include an acoustic consultant who shall develop the appropriate information at each stage of the design process to assure the Courts and GSA that sound/vibration issues have been properly addressed.

The following is a list of NIC and STC ratings for privacy levels required in a courthouse:

Privacy Level	NIC*	STC
Inaudible	65	55
Confidential	50	50
Normal	40	45
Minimal	27	40

*Per USCDG Standards

The STC ratings related to the Court's environment fall into three categories. These categories are listed below along with some typical examples of interior partition construction that will provide the appropriate acoustic isolation:

STC of 40-45: One layer of 12.7mm (1/2") gypsum wallboard on each side of steel studs to the underside of structure with acoustic sealant at top and bottom.

STC of 50: One layer of 15.9mm (5/8") gypsum wallboard on each side of steel studs, plus an additional layer on one side, to the underside of structure with acoustic sealant at top and bottom. (Install 69.8mm (2-3/4") glass fiber insulation in the wall cavity.)

STC of 55: One layer of 6.3mm (1/4") and 15.9 (5/8") gypsum wallboard on each side of steel studs to the underside of structure with acoustic sealant at top and bottom. (Install 69.8mm (2-3/4") glass fiber insulation in the wall cavity.)

Refer to discussions on the acoustic criteria for each courthouse facility space described in the USCDG. (The finished space performance will be tested against these specific requirements.)

Table 9-1
Accessibility Requirements

SPACE	ACCOMMODATION
COURTROOM	
Circulation Routes	Clearance and turning radius for wheelchairs throughout the courtroom.
Public Seating	Number of wheelchair spaces and location are set by UFAS and ADA.
Litigant Table	Height clearance at table(s) and circulation space.
Jury Box	One wheelchair space along the general circulation path at the box. (If located on a tier, provide a ramp or lift.)
Witness Stand	Wheelchair turning radius clearance. Permanent ramp or lift to provide access. (Adjacent space is required for an interpreter.)
Judge's Bench	Comply with space and maneuvering requirements of ADA. Adaptable for future inclusion of ramp or lift. (Electrical service, space, and floor depression to be included in the initial design for lift.)
Courtroom Clerk	Adaptable for future accommodation. (Raised level for clerk's position may be served by a movable ramp.)
Lectern	Include an adjustable platform with a height variation between 710mm and 760mm (28'' & 30'') above the floor. Knee space at least 685mm (27") high. The lectern must be at least 760mm (30'') wide and 480mm (19'') deep.
JURY & ANCILLARY FACILITIES	
Jury Assembly Room	Located on publicly accessible route. Refer to UFAS/ADA for number of wheelchair accommodating spaces. ADA determines requirements for listening devices. Kitchen-type service units and associated refreshment areas.
Jury Deliberation Rooms	One space at tables. Clearance provided at coat storage and dedicated toilet rooms. Portable assistive listening system may be used if there is more than one deliberation room. (Provided by Judiciary)
Witness Rooms **Attorney Rooms** **Conference Rooms**	Provide proper clearance for circulation and height at tables for wheelchairs.
USMS FACILITIES	
Court Holding Areas	Each classification of holding shall have one cell accommodating wheelchair clearances and an appropriate toilet plus lavatory.
Visitor Booths & Attorney/Prisoner Areas	One but not less than 5% of booths/areas must provide turning radius and counter height dimensions for a wheelchair on both sides.

White Plains Courthouse

9.3 Architectural and Interior Design

This section addresses technical requirements for architectural materials and systems which should be provided in buildings designed to serve the U.S. Courts. Specific requirements are presented for all special or unique Courts spaces and Court-related agencies, including those to accommodate the U.S. Marshals Service. See Chapter 13 of USCDG and Chapter 3 of this document for additional information.

General building design concepts for GSA-owned structures are based on an overall "systems" approach, utilizing all design elements of the building including: ceiling cavities; floor plenums created by use of access flooring; stacked vertical distribution cores; and centrally-located support areas; to increase functionality, improve flexibility for future modifications, and provide buildings which are efficient regarding construction, operation and maintenance costs.

Building Enclosure Systems

The baseline standard for quality of exterior materials for U.S. Court facilities is stone, brick, precast concrete, or other materials of substantial architectural character. Fundamental construction standards for the majority of the exterior building systems are discussed in Chapter 3.

Specific additional provisions for U.S. Court facilities include:

- Vehicular sallyport doors that meet USMS requirements.
- Appropriate (ballistic-resistant) glazing at various levels of a facility.
- Physical and electronic security design features at vulnerable areas that will decrease risk of attack to occupants or escape of prisoners.

- Level 4 classification of the DOJ Vulnerability Assessment and the Medium level protection of the Interagency Security Criteria.

Floor Systems

An important issue in the design of GSA-owned structures has been the evaluation and selection of an appropriate floor system, especially with the potential of using the plenum below for the horizontal distribution of conditioned air, power, data, telecommunication, and low-voltage system cabling; plus the related flexibility in position of connections above the floor. Accessible flooring systems can be defined as a suspended floor plane above the structural slab with relocatable modular components. Chapter 3 outlines appropriate dimensional characteristics of access floor systems for Federal facilities, describing the use of a 600 mm by 600 mm (2-foot by 2-foot) grid, having a clear raised depth, below floor supporting construction able to accommodate building system distribution below the floor. Access flooring shall be used in appropriate areas in courthouses, which include courtrooms, chambers, offices, conference rooms, etc.

It is extremely important to take in to account the height of the accessible floor system in the determination of floor-to-floor dimensions.

Standard floor finishes within each function of the Courts facility need to be selected primarily on the basis of acoustic enhancement and general durability.

The USCDG contains detailed information on specific requirements for the use of carpet and other floor finish materials under each category of functional space. The USMS-RSSPSSM contains the very stringent requirements for the USMS in all detention-related areas of their facilities.

Interior Wall Systems

Interior Partition Systems. Most interior wall partitions will be composed of gypsum board on metal studs with the exception of USMS detention spaces. (There may be instances in the general building construction where concrete masonry is used if building elements, including elevator or plumbing shafts, are stacked systematically floor upon floor.) Refer to the USCDG for further information related to recommended interior partition construction.

Ceiling Systems

Chapter 3 outlines the general parameters for selection of a ceiling system in typical office spaces and recommends the use of a standard 600 mm by 600 mm (2-foot by 2-foot) suspension system with a commercial quality, acoustic ceiling tile. The use of this system allows future flexibility in partition arrangement and corresponding relocation of mechanical diffusers, lights, sprinklers, and components of other systems such as speakers and fire alarm notification appliances.

There are several types of spaces with custom ceiling system requirements, which may include courtrooms public spaces, office and conference spaces of the courts or other agencies, and detainee areas. In historic buildings, satisfy acoustical requirements using removable finishes and features so that original ornamental surfaces may be maintained.

Courtrooms: Acoustic characteristics and aesthetics are the main considerations in the selection of a ceiling system. The ceiling design and materials must enhance the acoustic performance of the well area. (Ideal reverberation time in a courtroom is 0.5 to 0.6 seconds). This will involve the use of reflective and absorptive materials in the space.

Public Spaces: The ceiling system must accommodate future changes to the layout of the space and allow access for maintenance of the building systems above and within the ceiling plane including: mechanical systems; diffuser locations; smoke detectors; communication devices; lights; and life safety devices. Acoustic tile in a suspended ceiling grid is typically provided in these areas, along with supplemental use of gypsum wallboard in soffits, perimeter coves, recesses and reveals.

Office and Conference Spaces: Flexibility and durability are also the main considerations in the selection of a ceiling system which must accommodate change and accessibility above the ceiling plane. The ceiling material should absorb sound to provide speech privacy and control transfer of noise from machines, computers, light ballasts, and other sources within adjacent office areas.

Detainee Areas: Security and durability are the main considerations in the selection of a ceiling system. Refer to USMS-RSSPSSM for suggested ceiling materials in these spaces.

The USCDG outlines all of the appropriate interior finishes for U.S. Court related spaces.

Fixed and Movable Furniture

Components to be provided by GSA in U.S Court facilities include furniture and millwork required for the operations of the courts in courtrooms, grand jury, hearing room, jury assembly room, and public transaction counters. In general, built-in furniture needs to be designed with integral cable raceways plus conduits sized for future expansion and change. Built-in furnishings will also include access panels to permit easy cable and wiring changes. Provisions for power, data and telecommunication outlets and inputs; sound and other systems shall be confirmed during the Design Development Phase of the project on a position-by-position basis. Courthouse and office furniture systems must meet a variety of needs, and selection of these systems must consider function, cost, availability, and aesthetic criteria. The selection and design of fixed and movable furniture should be carefully coordinated to achieve a consistent image, proper function, and required clearances.

Movable furniture to be provided by GSA in the U.S. Court facilities will consist of miscellaneous items, to include lecterns, council tables for courtrooms, and grand jury spaces.

Typical provisions for moveable furnishings in U.S. Courts are indicated in tables provided for each category of space use in the USCDG. All items to be provided by the GSA within the baseline rent charges are assumed to be included within the anticipated construction budget.

Refer to the USMS-RSSPSSM for a detailed description of USMS fixed and movable furniture requirements in U.S. Court Facilities.

Fixed Components

Table 9-2 outlines the basic fixed furniture elements that are provided for all Courts related functions.

Signage and Graphics

Many Federal Courthouses are large, complex structures requiring clear and coordinated systems of signage and wayfinding which allows first time users to locate their place of involvement in the judicial process as quickly and directly as possible.

A standardized system of signage, with interchangeable components, is required throughout the courthouse. ADA Accessibility Guidelines are specific about parameters of design including location, size, color, and tactile qualities of signage and use of graphic symbols to assist non-readers.

Table 9-2
Typical Interior Fixed Furniture Elements

SPACE	TYPE OF FURNITURE ELEMENT
Courtroom	Judge's Bench (Refer to USCDG for specific configuration.) Deputy Clerk Desk (Adaptable for computer and printer.) Witness Box Fixed base chairs for jury and one not fixed Spectator Rail Jury Box Spectator Benches
Grand Jury Room	Bench Witness Stand Jury Rails Chairs
Judge's Chambers Suite	Kitchen-type serving unit with sink (Cabinets above and below) Book shelves
Judge's Robing Room	Lockers for robes
Judge's Toilet	Vanity, mirror, and medicine cabinet
Jury Assembly	Check-In counter Coat closet with rods Kitchenette-type serving unit (Cabinets above and below)
Jury Areas	Toilets with vanity and mirror Kitchenette-type serving unit Coat closet with rods
Library Spaces	Stand-up counter
All Public Areas	Stand-up counters
USMS Detention Cells	Benches Modesty screen
USMS Prisoner/Attorney Interview	Counter Stool (Prisoner side)
USMS Reception/Cashier	Service counter
USMS Staff Locker Rooms (Men's and Women's)	Lockers and benches Grooming shelf and mirrors Metal lockers Hooks or open closet rod and shelf for coats
USMS & CSOS Work/Mail Room	Base cabinets Work surface Shelving

Note: Refer to USMS-RSSPSSM for related furniture.

In addition to providing all general building identification and way-finding signage; GSA will supply all Courts related signs in public corridors of the building. Signage requirements within the Courts dedicated space, related to their function, will be provided by the Courts. Signs for life safety and public convenience (restrooms) within the functional areas of the Courts are supplied by GSA.

For installation of signage in historic buildings, the design team shall consult with the RHPO regarding the following requirements.

The following signage shall be furnished by GSA, and any remaining requirements will be determined and provided by the Courts:

Identification/Information Signage
- Building Identification/Seal/Cornerstone
- Division/Department, Tenant Agency Identification
- Courtroom/Room/Area Identification
- Special Function Identification – Library, Media Center, Cafeteria, etc.

Directional Signage
- Main Directory at Building Entrance – Graphic Plan
- Floor Directory on each floor – Graphic Plan
- Directory of Building Occupants with Suite Locations
- Directional Signage for Building Access by Handicapped
- Directional Signage for Parking/Restricted Entrances
- Directional Signage for Service Vehicles

Regulatory/Security Signage
- *Signage for Core Functions* – Restrooms, stairs, telephones, and other elements on ADA accessible path to building services.
- *Signage for Controlled Access Areas* – Judicial and staff areas and if admission to controlled areas is based upon recognizance, instructions for operating the call button/camera must be provided at the controlled door.
- *Signage for Dedicated Systems/Facilities* – Elevators, stairs, staff restrooms (Identification as dedicated and regulations for use stated)
- *Signage for Special Locking Arrangements*

Emergency Evacuation Route Signage
- Emergency evacuation route signage shall be posted in a tamper resistant frame or engraved on a placard that is mounted on the walls in each passenger elevator lobby, freight elevator lobby, and any mechanical spaces that may be occupied by contractors or other personnel not familiar with floor layouts and exit locations. The minimum size of the signage shall be 8 1/2 inches by 11 inches. This signage shall be depicted in either landscape or portrait form depending on the architectural layout and orientation of the elevator lobbies at each floor. {Also provide labeling as required in PBS ORDER 3490.1, Paragraph 7.d.(1), dated March 8, 2002.}
- The signage shall consist of a CADD generated floor plan for each floor with the evacuation routes identified (show routes to two different exits with directional arrows). Provide a "YOU ARE HERE" designation pointing directly to the signs final installed orientation. Also provide a main heading titled "EVACUATION PLAN". This signage may contain a zoomed in core area of the building (for a larger view of routes) if all evacuation routes and evacuation stairways are legibly shown. The signage shall contain a LEGEND for clarification purposes of any additional items shown on these evacuation plans. Also, include the following statement on plans "IN CASE OF FIRE DO NOT USE ELEVATORS - USE STAIRS".

9.4 Structural Systems

Byron White Courthouse, Denver, CO

General Requirements

The selection of the primary structural system for the new U.S. Court facility will be based on a variety of functional, technical, and load criteria. Whatever system is selected, the building should be planned with the longest logical clear spans (spacing between columns) and simplified structural framing to provide flexibility for modification/ adaptation to accommodate areas of special-use, including future courtrooms. (If space is dedicated to future Courts, the column layout must not disrupt internal sightlines of the courtrooms.)

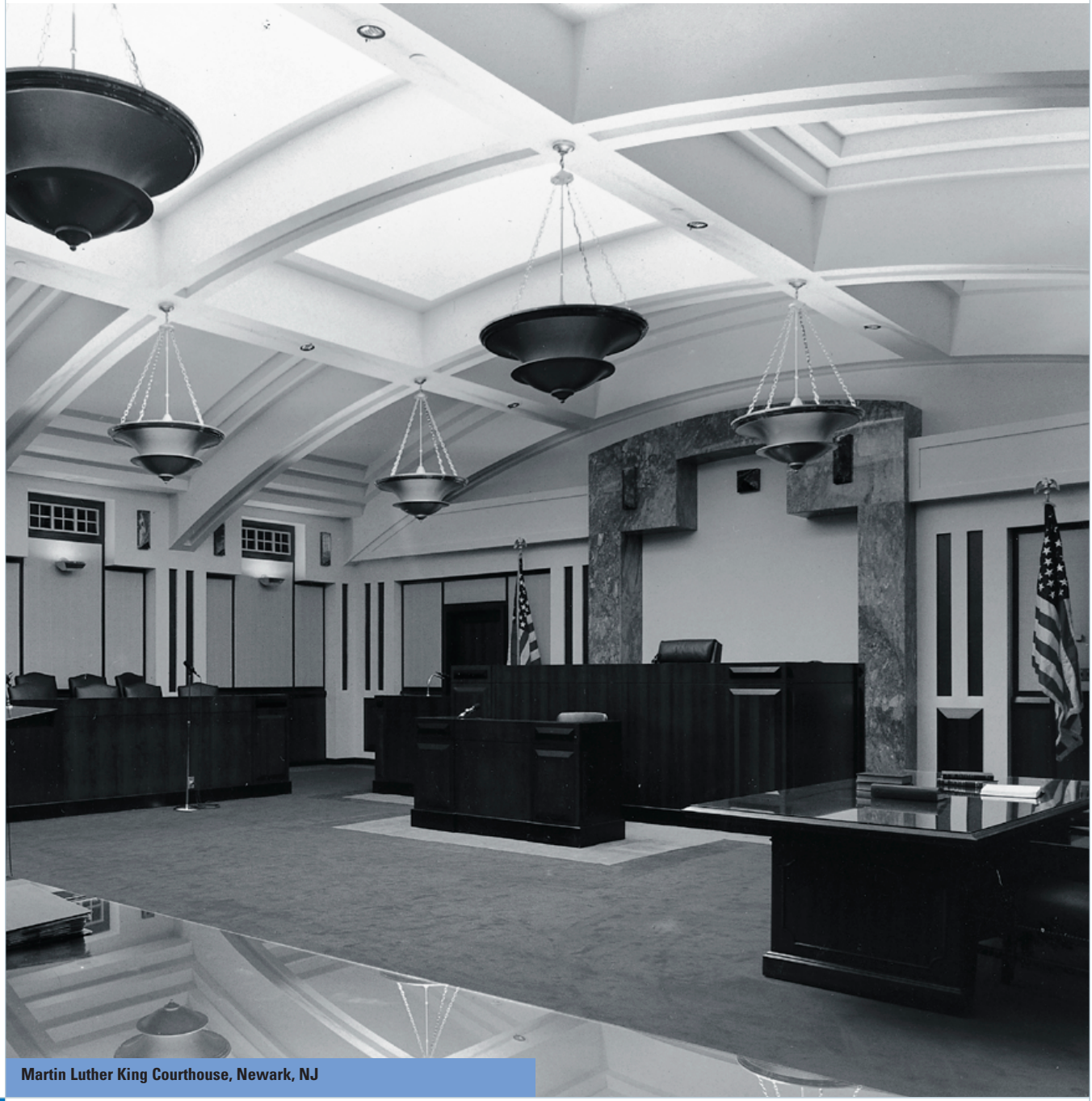
Design of the courtrooms and court-area structural configuration must respond to the needs for electrical and data/telecommunication systems and their related horizontal/vertical distribution network. An important consideration for a structural design is the number and size of floor slab penetrations required in court areas for initial and future renovation. Increasingly, the requirements of electrical and data/telecommunication systems require frequent access, and change to accommodate use of new technology.

Other design considerations include:

- **Floor-to-floor** heights providing adequate space for raised access floor systems.
- **Floor-to-floor** heights designed to support horizontal utility runs above the ceiling.
- **Floor-loading** capacities planned to accommodate initial and planned future loads, particularly in areas near building cores – which can serve as special "high" service zones.
- **Floor-loading** to accommodate the secure, solid filled, reinforced security walls wherever they may occur in the dedicated USMS space.
- **Roof loads** must consider general personnel and equipment loads, and should be planned to accommodate additional loads for antennas, satellite dishes, and window washing equipment.

Special structural capacity should also be provided in the following areas of U.S. Court facilities:

- **Judge's chambers** should be designed to provide 7.2 kPa (150 lb/sf) live load capacity.
- **Court library areas** (central and satellite) designed to provide 7.2 kPa (150 lb/sf) live load capacity.
- **Moveable shelving live loads** should be determined by reference to International Building Code requirements in the location where construction is taking place.
- **USMS space** per RSSPSSM.
- **Clerk of the Court file storage area** designed to accommodate high density file storage as identified by the court.



Martin Luther King Courthouse, Newark, NJ

9.5 Mechanical Systems

This section focuses on technical requirements for the mechanical engineering systems which should be provided in buildings designed to serve the U.S. Courts. Specific requirements are presented for all special or unique spaces used by the U.S. Courts and Court-related agencies, including spaces designed to accommodate the U.S. Marshal Service.

Federal Court facilities should be designed to take advantage of integrated systems and controls to provide better building performance through energy conservation, economy of operations, maintenance and flexibility for changes. Opportunities for system integration need to be evaluated throughout the design process.

U.S. Courts facilities require a variety of space types, each with it's own set of specific requirements. In addition, Court functions require flexibility in the time of operation and control of dedicated HVAC systems.

System Selection and Design

HVAC Specific Design Criteria Requirements

- Outdoor winter temperature equal to ASHRAE 1% design dry bulb and coincident wet bulb.
- Outdoor summer temperatures equal to ASHRAE 99% design dry bulb/97.5% wet bulb.
- Indoor air: Courtrooms – 22°C (74°F)/50% RH (at summer conditions and occupancy) - 22°C (74°F)/ 20-35% RH (at winter conditions and occupancy).
- If provided, the smoke purge system in the courtroom should be activated manually.
- All openings carrying piping through the slab or through partitions must be sealed with appropriate fire resistive/smoke resistive material. All air ducts leading to and from sensitive spaces must be acoustically treated with 2 inches (50 mm) of duct lining for a distance of at least 12 feet (3700 mm) from the diffuser or return air intake.
- HVAC systems shall be designed to provide optimum flexibility in scheduling the use of courtrooms and chamber areas.

General Criteria

The selection of the HVAC systems, equipment, and source of energy will be in accordance with the guidelines and procedures established in Chapter 5. Life Cycle Cost (LCC) analyses will be conducted to ensure selection of the most cost-effective alternative environmental considerations. The HVAC system should also be designed to provide 23.4°C (74°F) in judge's chambers, courtrooms and trial jury suites on average. The courtroom HVAC system will be designed so that courtroom thermostats can be reset from the building automation system to pre-cool the courtrooms to 21.1°C (70°F) prior to scheduled occupancy. Jury deliberation rooms, judges' chamber suites, and courtrooms are to be placed on the same system with separate zones having related thermostats and the design should account for variation in occupancy load. Humidification must be provided as specified in Chapter 5. Mechanical systems will provide 5.7 cubic meters (20 cubic feet) per minute as a minimum per person in all occupiable areas of U.S. Court facilities.

The HVAC systems shall be zoned in such a manner that the requirements of the special areas can be satisfied by efficient use of the systems and equipment. To allow flexible and efficient use of the HVAC systems for "after hours activity", and to satisfy specific requirements in a U.S. Court facility, the central plant equipment (chillers,

boilers, cooling towers, pumps, AHUs, etc.) will be designed using redundant equipment of various sizes to satisfy the requirements of differing number and sizes of zones. (The goal is to service no more than two courtrooms per each air handling unit.) Piping systems should consider arrangements to permit changing courtroom HVAC systems from primary to secondary chilled water for off hours. The design shall allow sub-metering of utilities and equipment to permit the facility manager to allocate cost of operation beyond standard-hours of operation.

Courtrooms/Chambers

Temperature and Systems Control. The HVAC system serving judge's chambers, courtrooms, and trial jury suites should provide an average temperature of 23.4° (74°F). The courtroom system zone will be designed to allow thermostats to be reset from the building automation system to pre-cool to 21.1°C (70°F) prior to scheduled occupancy.

Air Distribution. The diffusers serving the spectator areas must be sized to serve the allowable seating capacity plus 25%, to accommodate for extra seating. The diffusers need to be selected to meet minimum ventilation requirements at no loads, with no appreciable increase in system noise during load changes.

Provide six (6) air changes per hour for rooms with ceiling height up to 4.6 meters (15 feet); and eight (8) air changes per hour for rooms with a ceiling height greater than 4.6 meters (15 feet). Systems should be designed to meet these requirements when spaces are fully occupied, unless otherwise noted.

The maximum percentage of recirculated air should not exceed 85%.

If the courtroom is served by a fan system dedicated to more than one courtroom, then the return air from each courtroom and its associated areas must be ducted directly to the unit.

Return air from the chamber suites will be ducted directly toward the return air shaft for a minimum distance of fifteen (15) feet. (Treat ductwork to meet the acoustical design criteria.)

Jury Facilities

System Description and Control. Trial jury suites should be served from the same system as the associated courtrooms. (A separate thermostat for each trial jury room is desirable.)

Air Distribution. Air distribution systems in the jury facilities must provide separate temperature control and a high degree of acoustical isolation, particularly in the grand jury and trial jury rooms. Return air from the rooms must be ducted directly back to the exhaust air riser. Ductwork will be treated to meet the acoustical deliberation room design criteria.

Air Changes. In the Assembly Room, Deliberation Room, and toilet rooms, the system must provide 10 air changes per hour (ACH) with 80-85% return.

Refer to USMS-RSSPSSM for all detention requirements.

Harold D. Donohue Federal Building and U.S. Courthouse, Worcester, MA

Since U.S. Court facilities should be expected to have a long useful life, new construction and renovation projects need to be planned to provide adequate mechanical and electrical capability to the site and building(s) to support future additions. It is particularly important to design the systems for specialized areas of the building (lobby, food service, mechanical rooms, electrical rooms) to support the anticipated 30-year needs of the occupants. This can be accomplished by building additional space for future growth of the HVAC systems during initial construction and temporarily allocating it to building or tenant storage. HVAC designers shall locate equipment adjacent to the building perimeter wall that will abut future expansion for orderly tie into new system components.

The HVAC system design for the Courtroom, Judge's Chamber Suite, and the Jury Deliberation Room, which comprise a single "court set", shall be designed to allow the HVAC system to operate after hours.

The design shall include winter humidification for "special" designated areas in the building. Special controls for winter dehumidification will not be included since modern HVAC systems are designed to keep relative humidity within acceptable ranges.

Acoustic Performance

Acoustic performance should be a major consideration regarding the selection of HVAC equipment. Systems serving the courtrooms and auxiliary spaces should be designed with sound attenuation to provide consistent and acceptable sound levels. This is particularly critical in design of court facilities that require extensive use of sound and A/V equipment for recording and presentations.

Edward T. Gignoux U.S. Courthouse, Portland, ME

To control noise during all modes of operation and for all load conditions, the HVAC system should be provided with one or more of the following:

- Sound traps and acoustic lining in the duct work;
- Low-velocity, low static-pressure fan systems;
- Special low-noise diffusers; and
- Sound traps.

If air is returned by the ceiling plenum, special attention should be given to the location of any partitions extending to the floor structure above and to the acoustical treatment of the required penetration of these partitions for return air.

HVAC equipment including air-handling units (AHUs) and variable air volume (VAV) boxes will not be located in close proximity to courtrooms, jury rooms, and chambers. The minimum distance should be 7.6 meters (25 feet) between AHU and courtrooms. (Refer to Chapter 5, Theaters and Auditoriums, for criteria regarding maximum duct velocity.) General system design needs to provide appropriate treatment of mechanical supply/return ducts to minimize sound and voice transfer from courtroom, chambers, jury deliberation spaces, witness rooms to surrounding areas.

Noise criterion (NC), defines the limits that the octave band spectrum of noise source must not exceed, should range from 25-30 in U.S. Court facilities. For sound level maintenance, the courtroom needs to be served by constant volume air supply. The system must also support variable outside air requirements and variable cooling loads. Air ducts serving the trial jury and grand jury suites must be lined with 2 inches (50 mm) of acoustical absorption material for a length of at least 12 feet (3700 mm) from the diffuser or return air intake.

Mechanical System Diffusers, Vents

Mechanical system diffusers and grills in public and staff areas will need to be secure from tampering, particularly in areas which provide some degree of seclusion and privacy (restrooms, attorney-client visitation rooms, etc.). Maximum-security detention-type grilles, secured with tamper proof fasteners, shall be provided at all areas accessible to prisoners. (Refer to USMS-RSSPSSM for more information.)

Changes in Building Envelope to Meet Energy Guidelines

Due to the energy load requirements of court facilities, designers should use the alternative design processes of *ASHRAE 90.1R* to meet Federal energy guidelines for overall building energy usage. Increases in building envelope energy resistance should be used to compensate for higher than average load requirements resulting from court functions. Total building energy usage should be established according to calculations using mandatory design standards contained in Chapter 5. To demonstrate the same total energy usage, a new calculation will be done incorporating factors for energy reduction strategies to offset increased lighting, cooling and heating energy loads.

Information Technology System Loads

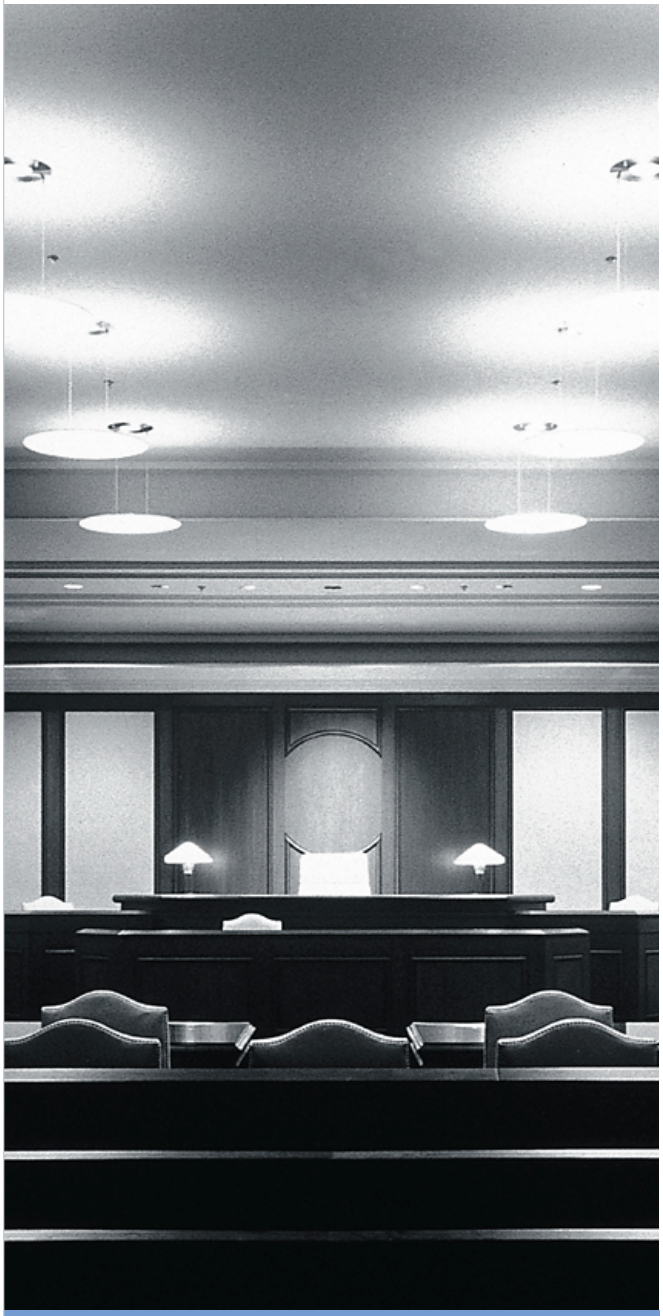
Information technology systems are not the largest source of heat within the office spaces but may be the largest sources in particular areas. Information technology systems will be the most uncertain source of heat flows during design phases, therefore the HVAC system should be planned with capacity and control to accommodate the need for constant temperature and humidity environments 24 hours a day, where systems hardware could be placed.

The design of the HVAC systems must take into consideration provisions for separate units for critical areas such as computer rooms, USMS control room, elevator machine rooms, etc., which generate additional heat loads. (The HVAC design for these areas should have redundancy and also be connected to the emergency power system.)

9.6 Fire Protection

Refer to Chapter 7: *Fire Protection Engineering* for sprinkler and fire alarm requirements.

All security systems, including those that control egress at the USMS detention area, will be connected to emergency power and meet the requirements of the International Building Code.



Robert C. Byrd Courthouse, Charleston, WV

9.7 Electrical Systems

GSA will provide emergency and secondary power distributed as a basic requirement.

Normal building distribution systems should be designed to comply with Chapter 6. They will include a special electrical distribution system, consisting of an isolation transformer with associated branch circuit distribution equipment, and should be designed to serve the data network system and associated equipment supporting non-linear loads.

Uninterruptible power will be provided to serve localized security, emergency smoke evacuation, and any other critical systems. This system should also be connected to the emergency power distribution system. (Other UPS for equipment is to be provided by tenants with their equipment.)

Spare Capacity. General design requirements for office and courtroom areas should be based on anticipated loads and requirements outlined in Chapter 6. The capacity of the feeders serving all areas of the building needs to accommodate growth to the extent shown in the 30 year long range plan for the facility.

Number of Outlets. The number of outlets provided in U.S. Court Facilities should be in accordance with: Table 9-3, Electrical Power Requirement/Outlets, electrical codes and good practice.

Grounding. The GSA will provide grounding as indicated in Chapter 6.

Clean Power. It is not economical, or convenient, to provide electrical supply from back-up generators and/or a central UPS to a small proportion of outlets in office areas. However, every desk in the courthouse is likely to support PC's or other data/telecommunication equipment, and "clean" (dedicated service with no harmonies or spikes) desk circuits should be protected by excluding "dirty" loads (such as large photocopiers and vacuum cleaners).

On-Floor Electrical Distribution

Most areas of the courthouse may incorporate underfloor horizontal distribution systems. Final horizontal distribution plans will be designed considering potential EMI/RFI sources. (Access floor areas will comply with Chapter 6.)

Emergency and UPS Power Systems

Service and Distribution. Emergency and normal electrical panels, conduit, and switchgear will be installed separately, at different locations, and as far apart as possible. Electrical distribution should also run at separate locations.

Conduit and lines need to be installed on the exterior of the building to allow use of a trailer-mounted generator to connect to the building's electrical system. This will be regarded as a tertiary source of power for systems in the building where operational continuity is critical. (An operational plan should be in place to provide this service quickly when needed.)

Emergency power will be derived from generators sized to carry the required loads. Generators should be synchronized to serve a common distribution board which, in turn, serves appropriate automatic transfer switches (ATS) and the fire pump. Separate ATS should be provided for the Life Safety/Security System, UPS system, and essential systems. (Essential systems will serve the ventilation and equipment loads required for personnel and building protection in the event of a commercial power failure or other catastrophic event.)

Discussions should be held early in the design process on a U.S. Court facility project to determine whether UPS is required for any function at the facility.

If a building-wide UPS system is provided, the system should serve the building distribution system at 208Y/120V. This system will have an output at 208Y/120V distributed through the building by a UPS power riser in each on-floor electric room. Taps from the riser will provide power to on-floor transformers and branch panels in each electric room to serve on-floor loads requiring UPS power. (Connected loads on the UPS power system may include PABX, computer and local equipment rooms.)

Coordination with Telecommunication System Design

Electrical power distribution for the various areas of U.S. Court facilities should be coordinated with the design of the telecommunication powering/grounding systems to improve the overall integrity of the telecommunications utility. As technology continues to increase in speed/performance, better distribution coordination becomes necessary. If this is not done, the grounding systems will not operate efficiently at the higher frequency ground currents, reducing the integrity of the telecom utility (creating errors in transmission, etc.).

Table 9-3
Electrical Power Requirement/Outlets

Note: This table is comprehensive, but may not be complete as needs and systems change over time and from court to court. These requirements are in addition to those described in Chapter 6.

LOCATION	EQUIPMENT/OUTLET(S)	NOTES
COURTROOMS		
Judge's Bench	Quadriplex receptacle for general purpose use; Duplex receptacle for computer, monitor; additional duplex receptacle for video arraignment.	
Courtroom	Duplex outlet with dedicated circuit for portable magnetometer. Branch circuits will be provided for additional loads dictated by the Courts.	
Court Clerk Workstation	One quadriplex receptacle (general use) and one duplex receptacle for PC and monitor per clerk position.	Printers as a group.
Court Reporter's Workstation	One quadriplex receptacle (general use), one duplex receptacle for reporter's computer/CRT.	Provide additional duplex receptacle(s) at alternate CR position(s) in the courtroom.
Witness Box	One duplex receptacle.	
Jury Box	One quadriplex receptacle for general purpose use.	Mounted on inside of jury box enclosure.
Attorney Tables	One quadriplex receptacle (general use) per attorney table position.	Recessed floor box.
Spectator Seating	One duplex outlet at front rail ("bar") for computer/monitor for CRT or other use.	Mounted on spectator side of rail enclosure.
Equipment Room/Area	Multiple outlets (as required) for sound, ALS, data, telecommunication and video recording and presentation equipment.	
Other	Duplex outlets at 20' intervals along the walls of courtroom. Duplex outlets at two locations (min.) in front of bench millwork. Additional outlets at appropriate locations for ceiling-mounted screen, fixed and/or movable positions for slide projector, video monitor, video recorder, interactive white-board and image copier, and x-ray viewer equipment. Locate floor boxes for multiple possible locations of a lectern and/or alternative locations for attorney tables. Provide additional outlets for initial/future location of video cameras. Provide outlet for wall-mounted clock. Provide outlet(s) for ALS unit(s). Provide outlets as required for video conferencing/arraignment equipment, video monitors/VCR equipment, security, and so on.	The courtroom well will have a suspended access floor system for flexible location of outlets.

LOCATION	EQUIPMENT/OUTLET(S)	NOTES
COURT SUPPORT		
Witness Waiting Rooms	Distributed convenience outlets, including provisions for cleaning/ housekeeping.	
Attorney/Client Conference	Distributed convenience outlets, including provisions for cleaning/ housekeeping and for audiovisual equipment (monitor/VCR).	
Public Waiting Areas	Distributed convenience outlets, including provisions for cleaning/ housekeeping. Provide outlets for clock. Duplex outlet with dedicated circuit for magnetometer outside sound lock.	
Media Area(s)	Distributed convenience outlets, including provisions for cleaning equipment and motor loads. Provide separately metered power outlets for news agencies telecast equipment.	
Law Clerk Office	One quadriplex receptacle (general use). Duplex outlet(s), two minimum, for PC, monitor, printer, FAX.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
Court Reporter Office	One quadriplex receptacle (general use). Duplex outlet(s), two minimum, for PC, monitor, printer, FAX.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
Judicial Conference Room(s)	Distributed convenience outlets. Provide outlets as required for video conferencing/arraignment equipment, video monitors/ VCR equipment, security, sound-system, ALS and other equipment, based on anticipated locations of equipment.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
JUDICIAL CHAMBERS		
Judge's Chambers	Quadriplex receptacle for general purpose use. Two duplex receptacles for miscellaneous uses (TV monitor, slide projector use, etc.). Two duplex receptacles for PC, monitor, printer and other computer equipment. Additional duplex receptacle for video arraignment and FAX equipment where required (initial/future use).	Duplex outlets for PC and monitor positions to be located in multiple positions (based on likely furniture placement). Computer and office equipment (PC, monitor, printer) not in FF&E budget.
Secretary/ Judicial Assistant	One quadriplex receptacle (general use). Duplex outlet(s), two minimum, for PC, monitor, printer, FAX.	
Work Area	Quadriplex receptacle for general purpose use. Duplex outlets for coffee machine, microwave unit, refrigerator, based on equipment/ furniture layouts. Additional outlet(s) for copier.	Equipment not included in base building budget. Refrigerator included in FF&E budget. Other equipment (PC, monitor, printer, FAX, copier, etc.) not in FF&E budget.

Table 9-3
Electrical Power Requirement/Outlets (continued)

LOCATION	EQUIPMENT/OUTLET(S)	NOTES
JUDICIAL CHAMBERS (continued)		
Reference/Conference General	Provide outlets for video conferencing, TV monitor, projectors. Distributed convenience outlets in reception/waiting and general office areas. Provide outlets for floor-cleaning equipment and motor loads. Provide outlets as required for video conferencing/ arraignment equipment, security, sound-system, ALS or other equipment, based on anticipated locations of equipment.	Computer and office equipment (PC, monitor, printer, FAX, copier, etc.) not in FF&E budget.
TRIAL JURY SUITE(S)		
Jury Deliberation Room	Distributed convenience outlets, including provisions for cleaning/ housekeeping. Outlets (GFI) on separate circuit for kitchen type service unit equipment (microwave, coffee maker). Outlets for film/ slide projection equipment, TV monitor and VCR, audio tape recorder/player. Outlet for wall-mounted clock.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
Other areas	Distributed convenience outlets, including provisions for cleaning/ housekeeping.	GFI in toilet areas, per codes.
GRAND JURY		
Witness Box	Duplex receptacle.	
Jury Seating	Convenience outlets, including provisions for cleaning equipment and motor loads.	
Court Reporter's Workstation	One quadriplex receptacle (general use), one duplex receptacle for reporter's computer/CRT.	Provide additional duplex receptacle(s) at alternate court reporter position(s) if applicable.
Attorney Tables	One quadriplex receptacle (general use). Recessed floor box, if appropriate. Foreperson One quadriplex receptacle (general use).	Recessed floor box, if appropriate.
Other areas	Distributed convenience outlets, including provisions for cleaning/ housekeeping.	GFI in toilet areas, per codes.
General	Distributed convenience outlets, including provisions for cleaning/ housekeeping. Outlets (GFI) on separate circuit for kitchen type service unit equipment (microwave, coffee maker). Outlets for film/ slide projection equipment, TV monitor and VCR, audio tape recorder/player. Outlet for wall-mounted clock. Power for sound, video system, if any.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.

LOCATION	EQUIPMENT/OUTLET(S)	NOTES
GRAND JURY (continued)		
Other areas	Distributed convenience outlets, including provisions for cleaning/ housekeeping.	GFI in toilet areas, per codes.
JURY ASSEMBLY		
Jury Assembly Room	Distributed convenience outlets. Provide outlets as required for video conferencing equipment, video monitors/VCR equipment, security, sound-system, ALS and other equipment, based on anticipated locations. Provide outlets for use at carrels and tables for jurors for personal use.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
Jury Clerk Workstation(s)	One quadriplex receptacle (general use). Duplex outlet(s), two minimum, for PC, monitor, printer, FAX.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
Other Area(s)	Distributed convenience outlets, including provisions for cleaning equipment/motor loads.	
LAW LIBRARY		
Circulation Desk	Outlets for PC, other equipment. Distributed convenience outlets.	
Public Waiting Areas	Distributed convenience outlets, including provisions for cleaning/housekeeping.	
Entry Control	Security equipment. Distributed convenience outlets, including provisions for cleaning/housekeeping.	Recessed floor box, if/as required.
Staff Offices	One quadriplex receptacle (general use). Duplex outlet(s), two minimum (for PC, monitor, printer, FAX) per workstation.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
Staff Work Areas	Distributed convenience outlets; quadriplex receptacle(s) for general purpose use. Additional outlet(s) for copier.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
CALR Areas	Duplex outlet(s), two minimum (for PC, monitor, printer, FAX) per workstation.	Recessed floor box, if/as required.
Carrel/Casual Seating Areas	Distributed convenience outlets. Provide outlets for use at carrels and tables.	
Conference/ Group Study/ Work Rooms	Multiple outlets (as required) for sound, ALS, data, telecommunication and video recording and presentation equipment. Duplex outlet for Microfiche machine.	

Table 9-3
Electrical Power Requirement/Outlets (continued)

LOCATION	EQUIPMENT/OUTLET(S)	NOTES
CLERK OF COURT AREAS		
Counter Work positions	One quadriplex receptacle (general use); duplex outlet(s), two minimum, for PC, monitor, printer, FAX; per workstation. Provide additional outlet(s) for cash registers, additional printers, shared-access PCs, printers.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
Public Waiting/ Document Viewing Areas	Provide duplex outlet(s) for public access PCs, monitor, printer, and FAX equipment. Provide outlet(s) on separate circuits for public access copier(s).	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
Other staff Workstations	One quadriplex receptacle (general use). Duplex outlet(s), two minimum, for PC, monitor, printer, FAX.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
Shared staff work Areas	Distributed convenience outlets; quadriplex receptacle(s) for general purpose use. Additional outlet(s) for copier(s), FAX equipment, etc.	Computer and office equipment (PC, monitor, printer) not in FF&E budget.
Staff Break Areas	Distributed convenience outlets, including provisions for cleaning/ housekeeping. Outlets (GFI) on separate circuit for kitchen type service unit equipment (microwave, coffee maker).	Equipment not included in base building or FF&E budget.
Other Area(s)	Distributed convenience outlets, including provisions for cleaning equipment and motor loads.	
COURT-RELATED AGENCIES/ SPACES		
	Similar to Court Clerk/Court Administrative areas above.	

NOTE:
(1) For all electrical power and outlet requirements in USMS dedicated spaces, refer to USMS-RSSPSSM.
(2) The power outlet requirements for each project should be verified.

A secure, air-conditioned data/telecommunications closet should be located near the judges' chambers, courtroom, and court offices to contain network equipment. (The use of cable trays rather than conduits needs to be considered.)

Lighting Systems

Illumination levels, lighting types, and lighting controls in specific court functional areas are provided in the USCDG. In all other spaces, illumination levels and lighting controls will be provided as specified in Chapter 6. Task lighting must be variable to 100 FTC (1100 lx).

Color accuracy is of the highest priority in the courtroom. GSA will provide fixtures with accurate color rendition, and avoid the use of metal halide fixtures. The use of indirect pendant-mounted fluorescent fixtures provides good soft diffuse general lighting in a courtroom; complemented with recessed concentrated light sources at: the judge's bench; the witness box; and attorneys' tables. Lighting levels must consider the impact of courtroom finishes.

An override switch will be located at the judge's bench and at the courtroom deputy clerk station to allow instantaneous over-ride of all dimming controls in an emergency.

The following lighting controls can be specified, depending upon the size of the courtroom, lighting arrangements, and lamp types:

- A more complex lighting installation consisting of local, wall, box-type, electronic, silicon-controlled rectifier (SCR) dimmers; or
- Remote electronic dimmers with pre-set lighting arrangements, for large courtrooms with high ceilings.

Control of lighting is the responsibility of the courtroom deputy clerk or another designated court officer and should be operated with a key. Light switches will not be accessible from the spectator seating area or witness box. Provision of integrated electronic controls should be considered with pre-set lighting schemes having integrated controls for: shading devices at windows and skylights; plus controls for presentation screens (if provided by the Courts). The controls should allow varying levels of light to suit the needs and desires of the courtroom participants.

Electronic ballasts for fluorescent lamps should not be used in areas that contain sensitive security devices, or special equipment that is sensitive to electronic interference, such as ALD infrared emitters.

Guidelines for site illumination are specified in Chapter 6. Lighting in parking areas must allow for identification of vehicle color, and the design should avoid the use of low-pressure sodium fixtures.

Emergency lighting for courtrooms and security areas, to include USMS detention facilities, will have built-in batteries plus emergency generator service.

Areas that require battery back up in the event of power failure to maintain camera and direct visual surveillance include:

- Vehicular Sallyport;
- Prisoner Sallyport and Movement Corridors;
- Detention Cell Block areas;
- Communications Center;
- Prisoner Processing areas;
- Squad Room;
- Public Reception Rooms;
- Prisoner-Attorney Interview room;
- Court Holding Cell Areas;
- Judge's Chambers;
- Interconnecting door from Public Corridors to Controlled Corridors;
- Command and Control Center; and
- Courtrooms

Audio/Visual Systems in U.S. Court Facilities

All audio/visual design and technical requirements are indicated in the Administrative Office of the United States Courts (AOUSC) Publication: *Courtroom Technology Manual*.

9.8 Security Design

Agency Responsibilities

Courthouse security is the joint responsibility of the judiciary, GSA Federal Protective Service (FPS), and USMS. (The USMS has the primary role in security decisions.) Decisions regarding security planning and design are made by individual agencies and the local Court Security Committee (CSC), or for multi-tenant buildings, the Building Security Committee (BSC).

The CSC is responsible for identifying the court's specific security requirements and developing a security plan for judicial facilities and operations throughout the district.

All security systems and equipment must be consistent with requirements in: *ISC Security Design Criteria* (Class Medium level protection buildings); the Department of Justice's (DOJ) *Vulnerability Assessment of Federal Facilities* (Level IV buildings); and the *United States Courts Design Guide* (USCDG); and *Requirements and Specifications for Special Purpose and Support Space Manual Volumes 1-3,* USMS publication number 64. The CSC must be informed about and have the opportunity to review all security-related design decisions.

The USMS Central Courthouse Management Group's (CCMG) Facilities Management Team is responsible for design considerations involving secure prisoner movement, holding cell and interview facility requirements, and USMS-occupied office and support space. The Judicial Security Systems Team (JSST) within the CCMG is responsible for the planning, design, and installation of security systems in spaces occupied by the judiciary. The USMS coordinates the work of the security system and security construction contractors.

In addition, the CCMG often acts as security engineer for court buildings, designing and integrating security systems for building perimeters in conjunction with the GSA.

Refer to the USCDG for a more detailed explanation of security design responsibilities.

Once the functional planning criteria including security related issues, as outlined in the USCDG and USMS-RSSPSSM, is implemented into the conceptual design for the new or renovated courts facility, it is intended to help in the development of the technical drawings, specifications, and other information to incorporate the security components into the project.