

Site, Landscape, and Community Design

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United States Courthouse

Erie, Pennsylvania

Architects: DPK&A Architects/ Kingsland Scott Bauer Associates,
A Joint Venture

GSA Project Managers: Edward H. Myers and Lawrence F. Boreali

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2.1 Goals and Objectives



Southeast Federal Center Master Plan, Washington, D.C.

The quality of the site design is a direct result of the building's integration with the site. It represents significant Federal investment and should, wherever possible, make a positive contribution to the surrounding urban, suburban or rural landscape in terms of conservation, community design and improvement efforts, local economic development and planning, and environmentally responsible practices.

See Chapter 1: *General Requirements* for a complete discussion of model codes and standards adopted by GSA. This section highlights regulations and standards that apply to site design.

2.2 Site Security

Site Design. Federal facilities must be safe and secure, yet still be accessible, welcoming, and effective workplaces. A successful site and landscape design addresses building and personal security while creating a setting that is engaged with the larger context in which it sits. Building setbacks for new construction are required to keep vehicles and other potentially harmful devices away from the main structure of the building, and the resultant spaces must be carefully designed. Security countermeasures shall be customized in each case, based on established principles, criteria, risk analysis, and site conditions. While entrance lobbies, garages, or other non-workspaces may, in some cases, be included within the setback, no building workplaces shall be within the setback without a waiver from the Commissioner of the Public Buildings Service. In establishing secure vehicle setbacks, planters, low walls, water features, trees, hardened street furniture, and landscaped berms may be creatively employed as perimeter barriers. Bollards also are quite acceptable when integrated with the design of the building and its surroundings. Barriers should be visually punctuated and as unobtrusive as possible to pedestrians. Consideration should be given to incorporating security features that allow for flexible use of the site, such as a gathering space away from the building, or a setting for artwork. High blank walls should be avoided; lower walls with sitting edges are preferable. Where feasible, features that provide required security should also provide visual and functional amenities for building users and visitors. Existing building security, where the current setback cannot be achieved, can be addressed through design of landscape elements at the perimeter, removal of on street parking, and expansion or acquisition of additional perimeter space. Security features in these areas must be carefully integrated with

their surroundings, while the acquisition and design must be closely coordinated with local officials early in the process.

Building Entrances. GSA buildings typically should have one primary entrance for staff, visitors and the public. In large facilities, secondary entrances may be created, with appropriate consideration given to impacts on security and building operations. Security screening stations shall be integrated with the building architecture, in close coordination with operational screening needs, and with designs to allow for future flexibility to accommodate improved technology. Designs shall address and accommodate foreseeable public queuing in projects where that is a concern.

Original primary entrances at historic and other existing buildings should be retained. Closure of ceremonial entrances and redirecting public access to below grade and other secondary entrances for security or accessibility purposes is discouraged and other ways to achieve security should be proposed. Wherever possible, access for the disabled to historic buildings should be provided at, or nearby original ceremonial entrances. See Chapter 8 for access controls and intrusion detection systems.

2.3 Site Analysis

Successful site planning and design depends on a thorough review and understanding of existing conditions on and around the site. An on-site investigation must be carried out prior to any design effort. For additional information see the GSA PBS document, *The Site Selection Guide*, found at www.gsa.gov/siteselection.

Site Survey. A complete site survey is required for all new construction projects and for alterations that involve work outside the existing building lines. Survey requirements are listed in Appendix A: *Submission Requirements*.

Geotechnical Investigation. Requirements for all geotechnical investigations are listed in Appendix A: *Submission Requirements*.

Archeological Testing. In some cases, GSA requires specialized testing by a contractor to determine whether archeological sites are present, and if so, to determine their extent, character and significance. If such testing is required, it should be coordinated with geotechnical testing to ensure that such testing does not inadvertently damage archeological resources. The GSA Project Manager will inform the architects and engineers when such archeological investigations may affect the project.

Flood Plains. No buildings shall be built within the 100 year flood plain. Buildings designated as “critical actions” (such as courthouses) shall not be built within the 500 year flood plains. Exceptions must be approved by the customer agency, PBS Assistant Commissioner for Portfolio Management and by the Chief Architect. If the building location is approved, mechanical and electrical equipment rooms must be located 1500mm (5 feet) above the level of the 100 year flood plain. For further information, see GSA order, GSA ADM 1095.6: Consideration of Floodplains in Decision Making, and the GSA PBS *Floodplain Management Desk Guide* found at www.gsa.gov/environmental.



Architectural model, U.S. Courthouse and Harborpark, Boston, MA

2.4 General Site Planning Criteria

Existing Site Features and Existing Vegetation. Existing natural features on the site should generally be preserved and be used as a starting point for the overall site design. Efforts should be made to preserve existing vegetation, particularly healthy trees and plant specimens. GSA promotes the protection and integration of existing vegetation and natural terrain into site design.

Energy Conservation. The use of site design to aid energy conservation and sustainability is encouraged. Solar orientation of the building and well placed plant material can be used to increase heat gain in the winter and reduce heat gain during the summer.

Environmentally Sound Practices. GSA promotes practices that are environmentally beneficial and conserve resources. Landscape designs and plant materials should reflect regional environmental concerns and promote minimal use or elimination of both chemicals and potable water for irrigation. Design and construction strategies should reduce stormwater runoff and polluted site water runoff. See www.lowimpactdevelopment.org for guidance.

Building Separation. Building separation and requirements for rated exterior walls and openings for protection from exposure by adjacent buildings or hazards shall comply with the requirements of the International Building Code (IBC).

2.5 Grading

Slopes. The slopes of planted areas should permit easy maintenance. Turf areas shall have a slope of no more than 3:1 and no less than 1 percent. A 2 percent minimum slope is desirable. Areas with slopes steeper than 3:1 must be planted with ground cover or constructed with materials specifically designed to control erosion. Slopes steeper than 2:1 are not acceptable. Terracing may be an appropriate solution for sites with large grade differentials, as long as access for lawn mowers and other maintenance equipment is provided.

Grading. Existing trees or other plant materials to be preserved shall be reflected in the grading plan. Where trees are to be preserved, the existing grade within the circle of the tree drip line must not be disturbed by regrading or paving. Snow fencing shall be erected at the drip line of the tree to protect existing trees from construction materials or equipment.

The minimum slope for grassy swales and drainage ways is 1 percent to prevent standing water and muddy conditions.

Slopes for walkways will not exceed 5 percent, unless unavoidable. Slopes greater than 5 percent may make the construction of special ramps for the disabled necessary. The maximum cross-slope is 2 percent. Preferably, walkways should not have steps. Where steps are necessary, cheek walls enclosing the risers and treads should be used to make a smooth transition to planted areas on the sides of the steps if grass is planted.

Parking areas or large entrance plazas should have slopes of 1 percent minimum and 5 percent maximum. Drives within parking lots should not be crowned. In areas with snowfall, provisions should be made for piling snow removed from roads and parking areas.

Drains should be provided at the entrance to ramps into parking structures to minimize the amount of rainwater run-off into the structure.

Paved areas adjacent to buildings will have a minimum 2 percent slope away from the structure to a curb line, inlet or drainage way to provide positive drainage of surface water.

For planted areas adjacent to buildings, the first 3000 mm (10 feet) should be sloped away from the structure to assure no standing water adjacent to basement walls and foundations (which could be detrimental).

No grading will be performed within the boundaries of any wetlands. For additional information see the GSA *PBS Wetlands Impact Management Deskguide* available for download at www.gsa.gov/nepa.

Cut and Fill. From a cost standpoint, it is desirable to minimize grading overall and to balance cut and fill, particularly in campus settings.

Storm Water Detention. Local code requirements for storm water detention must be followed. Detention of storm water on GSA building rooftops is not permitted.

2.6 Site Utilities



Reagan Building Plaza fountain, Washington, D.C.

Utilities/Services

The A/E will contact the local utility companies and/or other providers to determine the following: interest in providing service to the GSA; proposed rate structures and/or rebates; and system capacities, etc. This information will be compiled on the Site Analysis Data Sheets (see Appendix A: Submission Requirements). GSA will seek to negotiate contracts with the local utility companies and/or other providers to fix rates and establish connection charges.

Location of Aboveground Utility Elements. It is the A/E's responsibility to ensure that all utility elements, such as electrical transformers, emergency generators, backflow

preventers and meters, are located with access convenient to the utility companies and where they can be integrated with the building and landscape design without creating a negative visual image.

Water

Local Water Authority. Regulations of local water authorities must be followed. The service connection between building and public water line will be coordinated with the local water authority. Use monitoring points (including data logging functions) on primary water meters controlled by the Building Automation System (BAS). Where municipal graywater is available, service connections should be coordinated with the local water authority.

Dual Service. For large buildings or campuses, a loop system fed from more than one source must be considered. Some occupancies require dual service for the fire protection systems under the provisions of the International Fire Code (IFC).

Locating Water Lines. Water lines shall be located behind curb lines, in unpaved areas if possible, or under sidewalks if not. They shall not be located under foundations and streets, drives, or other areas where access is severely limited.

Fire Protection Water Supplies. A dependable public or private water supply capable of supplying the required fire flow for fire protection shall be provided for all new construction and renovation projects in accordance with the requirements of NFPA 24. See Chapter 7, *Fire Protection & Life Safety*, for additional information.

Special Requirements.

The requirements below supersede the requirements of NFPA 24:

- A secondary water supply for high rise buildings shall be provided in seismic zones 2, 3, and 4 by an on-site reservoir supplying fire pumps installed in accordance with NFPA 20. The supply to the fire pump shall include an auxiliary bypass (normally closed) from the municipal water supply. The secondary water supply shall have enough capacity to supply building fire suppression systems for a 30-minute duration in accordance with appropriate NFPA requirements.
- For buildings located in rural areas where established water supply systems for fire fighting are not available; the water supply shall be obtained from a tank, reservoir or other reliable source. The minimum quantity for adequate water supply shall be determined by the design team fire protection engineer and approved by the GSA regional fire protection engineer. See Chapter 7, *Fire Protection & Life Safety*, for additional information.

Fire Hydrants. Fire hydrants shall be provided for all new construction and renovation projects in accordance with NFPA 24. The local fire department shall be consulted with regard to their specific requirements regarding the locations of fire hydrants and thread types for hydrant outlets.

Sanitary Sewer

Local Sewer Authority. The regulations of the local sewer authority should be followed.

Discharge in Remote Rural Areas. In areas where no public sewers exist, septic tanks and leach fields should be used for sewage discharge. Cesspools are not permitted. Septic systems will have additional land area (in accordance with local and State code requirements) for future expansion of the discharge system.

Locating Sewer Pipes. All sewer lines will be located below unpaved areas if at all possible.

Manholes. Pipe runs between manholes should be straight lines.

Manholes must not be located in the main pedestrian route in walkways. The placement of manholes in other pedestrian areas such as plazas and entry courts should be avoided, particularly in the primary traffic routes across plazas and entry courts.

Cleanouts. Cleanouts will be provided on all service lines, approximately 1500 mm (5 feet) away from the building, and at all line bends where manholes are not used.

Storm Drainage

It is GSA policy to separate storm drains from sanitary sewers within the property limits, even in cities where separate public systems are not yet available. A storm drainage system may consist of vegetated swales, paved

channels or a piped system with inlets and manholes. These site strategies should coordinate with building strategies such as vegetated roofs.

In most cases building roof drainage will be collected by the plumbing system and discharged into the storm drains; exceptions are small buildings in rural areas where gutters and downspouts may discharge directly onto the adjacent ground surface.

Most storm drainage systems will be designed for a 25-year minimum storm frequency, unless local criteria are more stringent.

Gravity Drainage. Storm drainage systems should always use gravity flow.

Location of Storm Drainage Pipes. Storm drainage pipes will be located in unpaved areas wherever possible. It is desirable to offset inlets from main trunk lines to prevent clogging.

Rainwater Harvesting. Strategies for rainwater harvesting may be considered where appropriate, including filtering and retaining rainwater in cisterns for irrigation or flushing of toilets. Rainwater harvesting systems must comply with all local codes and standards.

2.7 Site Circulation Design

Site circulation design for GSA projects will vary greatly depending on the context, which can range from tight urban sites to suburban campuses or isolated rural settings. Yet the basic criteria remain the same in all situations: the site design should segregate, at a minimum, pedestrian access, vehicular access (including parking) and service vehicle access.

Security is an important consideration in site design. Refer to Chapter 8: *Security Design* for detailed criteria related to this matter.

Urban Site with Structured Parking

Service Traffic. Service dock access may be from an alley, from a below-grade ramp or from a site circulation drive. If large trucks are to service the facility, sufficient maneuvering space must be provided, and the service drive shall be screened as much as possible. It should always be separate from the access to the parking garage. Where possible, a one-way design for service traffic is preferable to avoid the need for large truck turning areas. The service area of the facility shall not interfere with public access roadways. See Chapter 3: Architectural and Interior Design for criteria on ramps and service areas.

Public Transportation. GSA encourages the use of public transportation among employees and visitors. The potential need for a bus stop should be considered early in the design of a GSA building in an urban setting and should be discussed with planners of the mass transit system. The project team should consider how to treat the orientation of the building and the site design and landscaping to encourage use of public transit and to address pedestrian traffic 'desire lines' between the building entrance and transit stops.



Oakland Federal Building, Oakland, CA

Pedestrian Circulation. The project team should consider neighboring uses, existing pedestrian patterns, local transit, and the building's orientation to anticipate pedestrian 'desire lines' to and from the building from off site. Designers should avoid dead ends, inconvenient routes, and the like and consider how people moving across the site might help to activate sitting areas, outdoor art, programmed events, etc.

Drop-Off. If the security analysis determines it is feasible, a vehicular drop-off area should be located on the street nearest the main entrance and, site conditions permitting, also near the entrance to the child care center, if the project includes one. See *GSA Child Care Center Design Guide* (PBS-P140).

Fire Apparatus Access

Fire department vehicle access shall be provided and maintained to all new construction and alterations in accordance with the requirements of the IFC, NFPA 241, and NFPA 1141.

Fire Apparatus Access Roads. The local fire department shall be consulted with regard to their specific requirements regarding the surface material of the access roadway(s), minimum width of fire lane(s), minimum turning radius for the largest fire department apparatus, weight of largest fire department apparatus, and minimum vertical clearance of largest fire department apparatus.

Aerial Apparatus. Buildings or portions of buildings exceeding 30 feet in height from the lowest point of fire department vehicle access shall be provided with access roads capable of accommodating fire department aerial apparatus. Overhead utility and power lines shall not be within the aerial access roadway. In addition, at least one access road having a minimum unobstructed width of 26



Bruce R. Thompson U.S. Courthouse and Federal Building, Reno, NV

feet shall be located within a minimum of 15 feet and a maximum of 30 feet from the building. Also, at least one side of all buildings shall be accessible to fire apparatus.

Vehicular Drives, Parking Lots and Service Areas

Entrance Drives. Follow local codes for entrance drive-ways within the right-of-way limits of city, county or State maintained roads.

Surface Parking Lots. Parking stalls must be 2700 mm (9 feet) wide and 5400 mm (18 feet, 6 inches) long, with two-way aisles of 7300 mm (24 feet). Where possible, 90-degree parking should be used. Accessible parking spaces must be provided; these shall comply with the UFAS/ADA in quantity, location and size.

Internal islands for landscape planting should occupy no less than 10 percent of the total parking lot area. Curbs should be provided around the parking lot perimeter and around landscape islands.

The maximum combined gradient for parking lots should not exceed 5 percent.

2.8 Pavements and Curbs

Materials. Usually the best wearing paving materials are those that are used extensively in the local area. Pavements and curbs should be designed for ease of long-term maintenance, not just for first cost. Where practical designers shall consider pervious or open grid paving or the use of light-colored/high-albedo materials to avoid a heat sink of dark surfaces.

Curbs. Curbs should be designed per local standard practice. Surface-applied precast concrete curbs or asphalt-type curbs are not allowed as a permanent solution for channeling traffic and/or drainage on site.

Public Streets and Sidewalks. The GSA project may be in an area for which there are no established urban design guidelines, but where such considerations would be valuable. Designs should consider proposing new curb lines, sidewalk widening, or street configurations to enhance pedestrian access, perimeter security, and urban design quality. Although such public works may not ultimately become part of the project scope, the design can be a catalyst for encouraging local action to enhance project quality.

Drives. Drives should meet local code requirements for street design, construction requirements, materials and surface finishes.

Fire Lanes. Grass pavers or open concrete grids are encouraged for fire lanes that do not carry normal vehicular traffic.

Service Areas. Areas for truck maneuvering should have concrete pavements.

Pavement Markings. Follow local street code.

Signage for Roads and Parking Lots. The minimum number of signs necessary to convey the information should be used; these must comply with UFAS/ADA.

2.9 Sustainable Landscape Design

Sustainable projects begin with site design. Issues of local ecology, impact on the surrounding areas, worker health, and building efficiency should be addressed from the initial site conception. The location and orientation of a building on the site will determine potential for natural light and views, shape energy usage, level of site disturbance, impact on neighbors, extent of pedestrian and vehicular movement. Storm water management, extent of paving, and landscape design will impact the local watershed, municipal storm water system, and water usage.

The goal for a sustainable site begins with the site selection. That will determine if the project is in an urban redevelopment area, brownfield, or greenfield; what



Russell B. Long Federal Building and United States Courthouse

alternative methods of transportation and local services are available; and what impact the project might have on the local community and infrastructure.

Some projects are located in a municipality with storm water management controls, design guidelines, or special landscaping requirements; local design guidelines should be followed. Where local government has not designated special districts or guidelines, GSA's project and site design may be a catalyst for encouraging such efforts.

Maintenance Considerations

Site design will influence the operations and maintenance of a facility. Low maintenance materials, non-invasive xeriscape, and carefully designed storm water systems can help reduce costs and effort.

Before initiating the site design, the architect and landscape architect should discuss with the facility manager how the landscaping, including paved and unpaved areas, will be maintained. If this information is not available, assume that only limited maintenance capabilities will be available.

Sustainable design benefits GSA with healthier, longer lived plantings that rely less on pesticides, herbicides and fertilizers, minimize water use, require less maintenance and increase erosion control.

General Design Principles

Sustainable landscape design considers the characteristics of the site and soil, and the intended effect and use of the developed area, in addition to the selection of plants. Where appropriate, regionally-native plants will be used. Zoning or grouping by plant materials may be considered if an irrigation system is to be used. Refer to the seven principles of Xeriscape™ on the Internet at www.xeriscape.org for further information.

Given limited maintenance budgets, GSA conceptually divides the areas in a typical site into two categories. Category I areas have high visibility—such as the building entrance—and consist of highly developed designs. These areas should be sensitive to the architectural features of the building, and can require higher maintenance. Category II areas have lower visibility—such as parking lots, maintenance areas and outlying areas—and are of simpler design and maintenance.

Design teams shall carefully consider how these landscape plans affect the use and feel of adjacent public spaces and properties. Where appropriate, they should coordinate design with local properties and plans—considering input but also encouraging compatible approaches by other developments.

The designer should discuss the appropriate amounts of Category I and II areas with the facility manager, as the proportions will depend on the level of total maintenance capability. As the landscape design is developed, Category I and II areas should be identified on the drawings to clarify the design concept. A preliminary description of the necessary maintenance program should also accompany the Final Concept Submittal. See Appendix A: *Submission Requirements*.

Soils will vary from site to site and even within sites selected by GSA. A soil test based on random samplings will provide the landscape architect with information needed for proper selection of plant materials and, if needed, soil amendments. The design will include those soil amendments to enhance the health and growing capabilities of the landscape.

Landscape Elements

Paths and Paving. Site design that encourages pedestrian activities is beneficial to the environment and to the health of the federal worker and visitors. Consider



Old Post Office historical preservation

walking/jogging trails in campus settings; design urban settings to encourage foot traffic. Consider durable pervious paving where appropriate for light automobile and pedestrian traffic; reduce extent of paving and avoid heat islands where possible.

Outdoor Plazas and Courtyards. Consideration should be given to development of plazas and courtyards for employee and visitor uses, and for both planned and passive activities. It may also be possible to incorporate program requirements into these spaces, for example, for use as outdoor dining or meeting spaces.

Fountains, Reflecting Pools and Ponds. Water may be used as a visual and possibly as an acoustic element. However, water features should not become a maintenance burden. Water consumption should be kept low,

especially in very dry climates with high evaporation rates. Non-potable water sources may be considered for these uses. In colder climates provisions must be made for easy shut-off and drainage during the winter season. Fountains and reflecting pools with pumping systems are restricted to Category I areas of the site. Water features should not be placed over occupied space since leakage problems frequently occur.

Sculpture. Sculpture may be provided as part of the Art-in-Architecture Program and is addressed by the site designer only as a coordination effort. The sculptor is selected under a separate contract; it is crucial, however, that the artist and the A/E coordinate not only the art installation, but how people will move to and from each other's designed areas and how one might support the other. It is also important to ensure that routine maintenance of the artwork can be performed at reasonable cost and that it does not create safety hazards.

Rocks and Boulders. Lightweight and synthetic rocks or boulders will not be used as landscape elements.

Water Conservation. Consider capturing rainwater or gray water systems for irrigation. See also 2.11 *Irrigation Systems*.

2.10 Plant Materials

Plant selection, including turf, shall be based on the plant's adaptability to the region. Regionally mature plants are recommended in desert or areas of the country where water is scarce. The use of hearty native turf species or other ground cover is encouraged.

Existing Vegetation. GSA has a commitment to using sustainable design principles in the landscape. Therefore, all existing vegetation should be evaluated for appropriateness to remain. Where appropriate, existing trees and shrubs should be protected and a planting plan be built around them.

Species Selection

Plant selection should be based on the plant's adaptability to the landscape area, desired effect, color, texture and ultimate plant size. Maximum water conservation can be achieved by selecting appropriate plants that require minimal amounts of supplemental water.

Hardiness and Availability. Plants must be hardy in the climate where they are to be planted.

Demanding Plants. Plants requiring meticulous soil preparation, fertilization and spraying shall be avoided. Exotic and/or invasive species shall not be used.

Growth Habits.

Plants need to be chosen with their mature size and growth habit in mind to avoid over-planting and conflict with other plants, structures or underground utility lines.

Placement

Landscape design should be closely coordinated with the architectural characteristics of the building and the community where the building is located.

Trees should not be planted where potential intruders could use them to climb a wall or reach an upper story window. Care should be taken that the selected plant material in parking lot islands or adjacent to walkways will not grow over time to become hiding places for assailants, or create a traffic hazard by restricting sight lines. Turf should not be used for small islands in parking lots because it is too difficult to maintain. Trees, shrubs in low hedge rows and low-maintenance ground covers are more suitable in these locations.

Shade. Trees should be placed to provide shady sitting areas, reduce heat and glare on hard surfaces, and enhance pedestrian comfort.

Planting Practices

Tagging. For most projects, tagging of plant materials at the nursery should be employed only selectively for specimen plants. Instead, specifications should be tight enough to provide criteria for a rigorous inspection at the project site and rejection of plants if necessary.

Staking. Local conventions for staking, wrapping and guying trees should be followed. Local extension horticulturists can provide good advice.

Warranties. Warranties for the replacement of plant materials must be specified to extend for 1 year after the date of building acceptance by GSA or 1 year after installation of landscaping, whichever is later.

Mulch. Mulch selection should be made upon the basis of local practice. Bark products, pine needles or other organic materials are preferred over inert mulches, such as gravel which reflects heat and can burn plants, in all geographic areas except those where drought tolerant planting (cacti, etc) is proposed. Where hydroseeding is proposed, hydraulic mulch with recycled paper binders should be specified.



Ronald Reagan Courthouse, Santa Ana, CA

2.11 Irrigation for Landscaping

System Design

General Criteria. An irrigation system (if required) will provide water to plants only when needed. High-efficiency irrigation technologies, such as drip irrigation, should be used. Care will be taken so that water can be conserved through the use of a properly designed irrigation system.

Non-potable water should be used as a source for the irrigation system when it is available.

Reliable performance must be a prime goal in the design of irrigation systems. Materials will be durable and relatively maintenance free. Irrigation systems will be most successful in the long run if local design practices are followed and locally available materials are used.

Allow for expansion of the irrigation system, both in area and in flow rate, so the system can be adjusted as plants mature.

Metering. Irrigation water should be metered separately from domestic water to avoid expensive user sewage fees.

Zoning. Irrigation systems shall be zoned so different areas can be watered at different times. Avoid mixing different head or nozzle types (such as a spray head and a bubbler) on the same station. Different types of vegetation, such as turf and shrub areas, should also not be placed on the same station.

Application Rates. The system shall be designed to minimize surface run-off. In heavy clay soils, a low application rate may be required. Overspray onto paved surfaces should be avoided.

Controls. Irrigation controls should be easily understood by maintenance personnel. The designer should coordinate with the Building Manager as to the appropriate controls. Provide automatic controls to allow for scheduling of watering times for late night and early morning to reduce water losses due to evaporation.

Rain sensors or soil moisture sensors are essential to prevent unnecessary watering. Freeze sensors should be provided for systems in cold climates.

Maintenance Considerations. All major components shall be installed in protected, accessible locations. Controllers and remote sensing stations should be placed in vandal-proof enclosures. Above-ground components, such as backflow preventers, shall be placed in unobtrusive locations and protected from freezing.

Quick coupling valves should be of two-piece body design and installed throughout the system to allow for hosing down areas and to permit easy access to a source of water. Locate drain valves to permit periodic draining of the system.

2.12 Landscape Lighting

Landscape lighting should be used to ensure safety and security on the site, to provide adequate luminaire placement, light distribution and visual comfort for nighttime visual tasks and to define visual interest by highlighting special site features. See Chapter 6: *Electrical Engineering, Lighting, Exterior Lighting*.

The primary purpose of any particular application of landscape lighting is to determine the hierarchy of requirements for light distribution and intensity. Generally, unobtrusive lighting designs and luminaire placement are preferred. Where the primary intent of the lighting is aesthetic, the A/E is encouraged to consider low-voltage systems.

Light Pollution Reduction. Site lighting should be designed to minimize light trespass from the building or site. In non-urban areas, this helps to reduce the impact of the development on the nocturnal environment. For more information on reducing light pollution consult the IESNA Recommended Practice Manual: Lighting for Exterior Environments, or visit, www.darksky.org.

Color. It is recommended that a consistent lamp correlated color temperature be used throughout the project site.



U.S. Courthouse, Brownsville, TX

Luminaires. Site luminaires should complement and be integrated with other site elements. Luminaire placement should include consideration of direct glare from light source and reduced contrast ratios to allow for proper and consistent use of night vision. To avoid plant damage and fire hazard, high intensity or heat generating luminaires shall not be located immediately adjacent to plant material. The required sleep cycles of plants should also be considered. Luminaires shall be resistant to vandalism and easily replaceable from local sources.

Controls. Landscape lighting and building illumination should be controlled by clock-activated or photocell activated controllers.

2.13 Site Furniture

Useful outdoor spaces require furniture just as much as do rooms in a building. Seating, tables, bollards, bicycle racks, cigarette urns, trash receptacles, flagpoles, lighting standards and tree grates should be considered as part of the initial site design.

Site furniture shall be compatible in design, size and color with the surrounding architecture and landscape design. They should be selected and submitted in the Design Development package (see Appendix A: *Submission Requirements*).



Jacob Javits Plaza, New York, NY

Seating. GSA is committed to providing public amenities such as outdoor seating. The design should consider appropriate locations (bus stops, plazas) where seating could be used. Movable furniture can be an important component in effective public plazas and courtyards. In many intensively-used public spaces, it is an effective supplement to built-in seating. Where appropriate, perimeter walls and stair elements should be designed to provide comfortable height and depth for seating. Seating should be designed and placed on the site to provide choices for employees and visitors, including sun and shade, fixed and movable, etc.

Trash Containers. Locate trash containers at the entrances of buildings, on the path people will take to leave a seating area, and other locations to encourage their use. Provide recycling containers to collect items in keeping with the local recycling opportunities.

Bicycle Racks. The use of bicycle racks shall be considered at all GSA facilities (LEED criteria suggest racks for 5% of building occupants). Bicycle racks shall be placed in a location that is convenient to riders, such as a parking garage, parking lot or near a building entry. This location should be highly visible by building occupants, security personnel or by general traffic or in a secure (locked) area for use only by employees. Racks shall have provisions for locking bicycles to them. Bicycle racks shall be compatible with the architecture and landscape design.

Materials. Materials for outdoor furniture must be very durable and resistant to vandalism. Movable furniture can be an important component in effective public plazas and courtyards. In many intensively-used public spaces, it is an effective supplement to built-in seating. Metals that require repainting shall not be permitted. Consider the use of recycled-content materials for seating, when appropriate.

2.14 Site Signage

A well-designed site should use as few signs as possible. Signs should make the site clear to the first-time user by identifying multiple site entrances, parking and the main building entrance.

Generally, graphics and style of site signage should be in keeping with the signage used inside the building. Signs integrated with architectural elements can also be very effective. There shall be a consistency in the font style and color plus any directional symbology used in site and building signage. Signage placement can be an important detail element of the building design whether prominently displayed and tooled into the exterior building wall materials or as a freestanding component near the entrance to the facility. See Chapter 3: *Architectural and Interior Design, Guidelines for Building Elements, Artwork and Graphics, and Exterior Closure, Cornerstone and Commemorative Plaques* for applicable standards.

Additional information about GSA graphic standards can be found at www.gsa.gov/logo.

Construction Signs

All GSA new construction and prospectus level repair and alteration projects must display an official construction sign on the site, in a prominent location. Construction signs must conform to the following specifications.

All Construction Signs. The size of the sign shall be 3600 mm by 1800 mm (12 feet by 6 feet). It shall be constructed of a durable, weather resistant material, properly and securely framed and mounted. Standard GSA color (blue) with white lettering should be used. Signs shall be mounted at least 1200 mm (4 feet) above the ground,



display the official GSA logo which should be no less than 400 mm (16 inches) square, and provide the following information:

- Building for the People of the United States of America
- (Name of) Federal Building
- Constructed by (building contractor)
- U. S. General Services Administration – Public Buildings Service
- (President's name), President of the United States.
- (Administrator's name), Administrator, GSA
- (Name), Commissioner, PBS
- (Regional Administrator's name), Region X Administrator
- The lettering, graphic style, and format should be compatible with the architectural character of the building.

New Construction Signs. Signs at new construction sites shall include the name of the architect and general contractor and may contain an artist's rendering or photograph of the model of the building under construction.

Repair and Alteration Projects. Signs at prospectus level repair and alteration project sites shall include the name of the architect and/or engineers for the major systems work (i.e. structural, mechanical, electrical), if appropriate. In addition, the sign should include the name of the general contractor.



Charles Evans Whittaker United States Courthouse, Kansas City, MO

2.15 Flagpoles

A ground-mounted flagpole, located preferably at the left of the entrance (facing the building), must be provided for new Federal buildings. If ground-mounted poles are not feasible, a roof-mounted pole is permissible; or, if roof mounting is not suitable, an outrigger pole may be used. Only one flagpole is needed for a complex of buildings on a common site. The flag shall be illuminated.