**6. ENGINEERING SYSTEMS REQUIREMENTS**

**G20 SITE IMPROVEMENTS**

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SYSTEMS REQUIREMENTS  
SITE IMPROVEMENTS TEMPLATE 09/22  
  
Instructions for using this template: There are template files for each UNIFORMAT Level 2 Group Elements. This template is for Group Element G20-SITE IMPROVEMENTS. Text such as this is hidden text that will not print when the hidden text box in "Print/Options" is un-checked.  
  
The Civil Member must edit this template for the requirements of the project. The Landscape Architect Member must edit the G2050 portion of this section for landscaping if required for the project. The SYSTEMS REQUIREMENTS are intended to define items that are required for the site work. Editing is required where brackets [ ] appear. Delete all building elements that are not required for the project. If additional elements or sub-elements are required for the project that do not appear in the template, refer to the NAVFAC DB RFP Web Site Uniformat II/ WBS for additional site element numbers and descriptions. The Uniformat II Work Breakdown Structure can be found at** [**www.wbdg.org/ndbm/**](http://www.wbdg.org/ndbm/) **. Coordinate with the PERFORMANCE TECHNICAL SPECIFICATION SECTION G20 to ensure that performance requirements are provided for all of the Site Elements listed here and that paragraph numbering matches.  
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NOTE: Edit the following paragraphs to suit the project, or create your own, to describe the SITE IMPROVEMENTS for the project. Coordinate this section carefully with other portions of the RFP.  
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NOTE: Consider site improvement activities and components relative to Part 2 UFGS Section 01 33 29, *Sustainability Requirements and Reporting*and UFC 1-200-02, *High Performance and Sustainable Building Requirements*.  
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NOTE: A blank Permits Record of Decision (PROD) form is included in Part 6 of the Standard Template Complete Set zip file on the WBDG Design-Build Request for Proposal page.  
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**SYSTEM DESCRIPTION**  
Provide site improvements that support project sustainability goals of& Part 2 UFGS Section 01 33 29, *Sustainability Requirements and Reporting*.

The site improvements consist of pavements and pavement related features, landscaping and other exterior site development work related to this project. Provide a pavement design by a licensed Professional Engineer familiar with conditions local to the project site. Site design, including but not limited to design of parking and pedestrian circulation, will include coordination with the Civil Engineer and the Landscape Architect.

**GENERAL SYSTEMS REQUIREMENTS**  
Provide site improvements as required to make a useable facility that meets functional and operational requirements, incorporates all applicable anti-terrorism, force protection and physical security requirements and blends into the existing environment.

Provide accessibility in conformance with requirements of [UFC 1-200-01](https://www.wbdg.org/ffc/dod/unified-facilities-criteria-ufc/ufc-1-200-01) , *DoD Building Code (General Building Requirements).*

Identify and obtain permits to comply with federal, state, and local regulatory requirements associated with this work. Complete the Permits Record of Decision (PROD) form with the first design submittal package. Determine correct permit fees and pay said fees. Forward copies of permits, permit applications, and the completed PROD form to the Government's Civil Reviewer. Perform work in accordance with the obtained permits.

Minimize the impact of construction activity on operations and neighboring facilities.

Locate new site improvements at locations indicated on the drawings in another part of this RFP. If specific locations are not provided, site the improvements to develop appropriate and positive relationships with other facilities and to conform to existing development patterns.

Refer to Site Analysis and Building Requirements Sections for additional site improvement functional program information.

**G2010 ROADWAYS**

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NOTE: Indicate project requirements here.  
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Provide roadways, as required, to allow for safe, convenient and logical circulation, while discouraging through traffic. Design pavements based on the anticipated daily traffic ([\_\_\_] cars, [\_\_\_] single unit trucks, [\_\_\_] H20 loadings) over the life of the project ([25] [\_\_\_] years) as well as the existing soil conditions at the site.

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NOTE: Indicate Activity's pavement preferences. Permeable paving materials include pervious concrete and permeable interlocking concrete pavers. Aggregate pavements may be required on certain projects.  
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Provide roadways of [bituminous pavement][Portland cement concrete (PCC) pavement][\_\_\_\_\_\_] [where indicated on the drawings in Part 6]. [Permeable pavement is not allowed.] Aggregate pavement may [not] be used.

[Provide new roadway and other pavement sections as required by soil conditions and determined by the Designer of Record. Design pavement sections in accordance with UFC 3-201-01 *Civil Engineering*.] [Provide pavement sections as indicated or specified in this RFP.]

Provide other roadway improvements including [bus stops ][traffic signalization ][markings ] [signage ][\_\_\_\_\_].

[Where street or roads are adjacent to median planting, provide a minimum [2 feet (600 mm) wide (including curb)] [ ] concrete maintenance walk adjacent to street or road to allow for landscape [and irrigation] maintenance.]

[Include adequate space for trees and other landscape material in the design for streets, roads, and parking lots in accordance with PTS G2050.]

**G201001 BASES & SUBBASES**

[The following materials will not be allowed for base or subbase courses: [bituminous concrete,] [lean concrete,] [cement stabilized,] [sand-clay,] [lime rock,] [shell,] [crushed concrete,] [reclaimed asphalt,] [or] [ ].]

**G201002 CURBS & GUTTERS**

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NOTE: Include requirement below when the Activity prefers curb and gutter. Delete this section if not required.  
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Provide curb and gutter to tie into adjacent facilities.

**G201003 PAVED SURFACES**

[Provide Portland cement concrete with a minimum design flexural strength of 650 psi (4.48 MPa) in not more than 28 days.]

Recycled asphalt pavement material may [not] be used for [bituminous] [concrete] pavement [as permitted by the SHS].

**G201004 MARKING & SIGNAGE**

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NOTE: Indicate Activity's preferences on pavement markings and signage, especially where required to tie into existing site elements. Also indicate any temporary markings and signage needed to meet phasing requirements. Coordinate with PTS Section G201004. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide pavement markings [including crosswalks][to match existing][\_\_\_\_\_].

Provide signage [to match existing][\_\_\_\_\_].

Provide temporary pavement markings and signage throughout construction to meet phasing requirements indicated in the project program. Provide temporary signage in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).

**G201005 GUARDRAILS & BARRIERS**

Provide [guardrails], [wheelstops], [and] [bollards] in accordance with UFC 3-201-01, *Civil Engineering*.

**G201006 RESURFACING**

Provide resurfacing of existing pavement by [slurry seal,][bituminous surface treatment,][or][bituminous overlay].

**G2020 PARKING LOTS**

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NOTE: Indicate project requirements here.  
\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide parking for \_\_\_\_\_ vehicles [above and beyond the existing parking area]. The design of pavements must include the anticipated daily traffic ([\_\_\_] cars, [\_\_\_] single unit trucks, [\_\_\_] H20 loadings) over the life of the project ([20] [\_\_\_] years) as well as the existing soil conditions at the site.

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NOTE: Indicate Activity's pavement preferences. Permeable paving materials include permeable interlocking concrete pavers and pervious concrete. Aggregate pavements may be required on certain projects.  
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Provide parking lots of [bituminous pavement] [Portland cement concrete (PCC) pavement] [permeable pavement] [\_\_\_\_\_] [where indicated on the drawings in Part 6]. [Provide permeable pavement by [permeable interlocking concrete pavers] [or] [pervious concrete]; porous asphalt must not be used]. Aggregate pavement may [not] used.

[Provide new parking and other pavement sections as required by soil conditions and determined by Designer of Record. Design pavement sections in accordance with UFC 3-201-01 *Civil Engineering*.] [Provide pavement sections as indicated or specified in this RFP.]

Provide other parking improvements including [\_\_\_\_\_ parking entrances for [one] [two] way traffic] [\_\_\_\_\_motorcycle parking stalls ][\_\_\_\_\_bicycle stalls ] [separate service drive for delivery vehicles] [drive-up drop-off access] [markings ][signage ][landscaping ][\_\_\_\_\_]. [See ESR G2050 for parking lot landscape requirements.]

Provide handicapped parking in accordance with [UFC 1-200-01](http://www.wbdg.org/ccb/browse_doc.php?d=400) , *DoD Building Code (General Building Requirements)*.

**G202001 BASES & SUBBASES**

Crushed concrete meeting specified gradation for aggregate base or subbase courses may [not] be used. Bituminous concrete millings may [not] be used.

**G202002 CURBS & GUTTERS**

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NOTE: Include requirement below when the Activity prefers curb and gutter. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide curb and gutter to tie into adjacent facilities.

**G202003 PAVED SURFACES**

[Provide Portland cement concrete with a minimum design flexural strength of 650 psi (4.48 MPa) in not more than 28 days.]

Recycled asphalt pavement material may [not] be used for [bituminous][concrete] pavement [as permitted by the SHS].

**G202004 MARKING & SIGNAGE**

Provide permanent and temporary markings (pavement, curb and object), signage (regulatory, warning and guidance) and other traffic control devices as required to facilitate proper utilization of the parking areas.

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NOTE: Indicate Activity's preferences on pavement markings and signage, especially where required to tie into existing site elements. Also indicate any temporary markings and signage needed to meet phasing requirements. Coordinate with PTS Section G201004. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide pavement markings [including crosswalks] [to match existing][\_\_\_\_\_].

Provide signage [to match existing][\_\_\_\_\_].

Provide temporary pavement markings and signage to meet phasing requirements indicated in the Project Program. Provide temporary signage in accordance with the MUTCD.

**G202005 GUARDRAILS & BARRIERS**

Provide [guardrails], [wheel stops], [and] [bollards] in accordance with UFC 3-201-01, *Civil Engineering*.

**G202006 RESURFACING**

Provide resurfacing of existing pavement by [slurry seal,][bituminous surface treatment,][or][bituminous overlay].

**G202007 MISCELLANEOUS STRUCTURES AND EQUIPMENT**

**G2030 PEDESTRIAN PAVING**

Provide a network of [Portland cement concrete (PCC)] [PCC with colors embedded in the mix, stamped with special patterns] [solid concrete pavers] [brick pavers] [permeable interlocking concrete pavers] [concrete grid pavers] [pervious concrete] sidewalks, separated from, but connected to vehicular circulation systems, to allow for pedestrian circulation between various new and existing elements of the project. Interface new pedestrian circulation systems with existing pedestrian circulation systems and include input from the Civil Engineer, Architect, and Landscape Architect.

**G2040 SITE DEVELOPMENT**

**G204001 FENCING & GATES**

Provide [chain link] [ornamental] [security] [and] [\_\_\_\_\_] fence [as indicated on the drawings in Part 6].

[Provide [zinc-coated steel fencing components in accordance with FS RR-F-191/1, Type 1] [polyvinyl chloride (PVC) coated over zinc-coated steel fencing components in accordance with FS RR-F-191/1, Type IV] for the fencing system. [Provide a PVC coating with color and a minimum thickness of 0.10 inch (2 mm).] Provide [[top] [and] [bottom] tension wires] [and] [[top] [and] [bottom] rails]; where tying into an existing fence, match fencing system. ]

[Provide an ornamental fence of [wrought iron] [wood] [ ]. ]

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NOTE: UFC 4-022-03, *Security Fences and Gates*, indicates that two single-line fences may be used, when specified by the local commander, to surround a restricted area. Unless otherwise directed all security and perimeter fencing must have a minimum fence fabric height of 7 feet (2.13 m).   
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[For the security fence, provide [one] [two] single line fence[s] surrounding the restricted area. Provide security clear zones as required. Ensure that the fabric height is at least [7 feet (2.1 m)][ feet ( meters)]. Provide outriggers and [three][ ] strands of barbed wire. ] Design security fencing in accordance with UFC 4-022-03, *Security Fences and Gates*.

**G204002 RETAINING AND FREESTANDING WALLS**

**G204003 EXTERIOR FURNISHINGS**

Site furnishings are required to conform to the Base Exterior Architectural Plan (BEAP) and the Installation Appearance Plan (IAP). Provide [picnic tables][trash receptacles][benches] [barbecues] [recycling receptacles] [hot ash receptacles] [\_\_\_\_\_\_] [as indicated on the drawings in Part 6]. At a minimum, provide a trash and ash receptacle at the designated smoking area.

[Provide picnic areas [as indicated on the drawings in Part 6]. Design picnic areas to accommodate up to [twelve] [ ] people.]

**G204004 SECURITY STRUCTURES**

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NOTE: Coordinate with Base Security on the Activity's security needs for the project during the RFP Development meeting. Indicate the number of active vehicle barriers required and revise text below to reflect specific requirements of the Activity and the project. Use shallow foundation active barriers in areas with a high water table or a high probability of salt corrosion. Where proper drainage may be a problem, consider larger diameter pipes to convey drainage away from barrier sump or sump pump options supplied by barrier manufacturer.  
  
Vehicle barriers must be designed in accordance with UFC 4-022-02, Selection and Application of Vehicle Barriers. When vehicle barriers are required for a project, the RFP Editor must edit UFGS Section 34 71 13.16, Vehicle Crash Barriers, for the project and include the edited section in Part 5 of the RFP.  
  
Delete portions of this section that are not used.  
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Provide \_\_\_\_ active vehicle barriers. Provide an automatic, active vehicle barrier system, including [barricades,] [bollards, ][crash gates, ][crash beams, ][and][active tire shredders]. [Provide active vehicle barricades, ] [bollards, ][and ][crash gates] with a Department of State certified crash rating of [K12][\_\_\_\_\_]. [Provide crash beams capable of withstanding a 10,000 pound (4536 kg) vehicle at impact speed of 15 mph (24 kph), with a maximum beam deflection of 20 feet (6 m).] [The active vehicle barrier must provide protection from unauthorized vehicle access over the entire entryway and be capable of being controlled in the emergency mode at the following locations: [gate house][\_\_\_\_\_].] Properly protect and rate outdoor controls.

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NOTE: Coordinate specific mounting location(s) of EFO buttons with Base security during the RFP development meeting, and comply with UFC 4-022-01 Security Engineering: Entry Control Facilities/Access Control Points.  
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The emergency fast operation (EFO) is used when a threat condition exists requiring immediate activation of the barrier to prevent unauthorized access. The EFO will have the ability to be activated by [1][2][\_\_] button[s] located [within the ][Gate House,][Sentry/Guard Booth,][Overwatch Position,][channelization island,][Large Commercial Vehicle/Truck Inspection Facilities, ][and ][\_\_\_]. Properly protect and rate outdoor controls. The time of deployment from the down to the fully raised or from the open to the fully closed position in the EFO mode must not exceed [1][\_\_\_\_\_\_] second[s], and the time to close the barrier from the deployed position must not exceed [5] [ ] second[s]. In EFO, all the barriers for a gate location must deploy at the same time and initiate an alarm signal at the [Installation dispatch center] [ ].

The master reset control for lowering the barrier, after EFO, must be a keyed switch located within the gate house control panel. The key will be stored offsite so that lowering/opening of the barriers can be accomplished only by authorized personnel.

Provide the vehicle barrier with a safety feature to prevent accidental raises under or closing on authorized vehicles. Provide dilemma zone protection for all legal vehicles. Provide warning signage, loop detectors, and traffic signal lighting in advance of the barrier. Include additional features: [corrosion protection, ] [heater, ][and][insulation]. In the event of a power outage or interruption, operate the vehicle barrier system on an [UPS system][ and ][emergency generator].

The vehicle barrier sump discharge line must be hydraulically evaluated by the DOR for sizing independent of manufacturer provided materials so as to ensure adequate drainage capacity.

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NOTE: Include the following sentence when the location of active barriers may disrupt housing or office environments.  
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[Provide sound attenuating features in active vehicle barriers.]

Provide a passive barrier system including [reinforced concrete inverted "T" wall, ][anchored concrete Jersey barrier, ][bollards, ][posts, ][tires, ][guardrails, ][ditches, ] [boulders] [and][cable reinforced fence].

Design the passive barrier systems to withstand the design vehicle threat stated in Chapter 2.3.5 given the attainable vehicle velocity at a given location. [Design the reinforced concrete inverted "T" wall for no penetration. Design the inverted "T" wall to provide the best aesthetic visual appearance possible. ][Each bollard must have a maximum vehicle penetration of 20 feet (6 m).] [Design the cable reinforced fence for a maximum penetration of 40 feet (12.2 meters).]

**G204005 SIGNAGE**

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NOTE: Coordinate with Activity on special signage required for the project. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

Provide signage in accordance with the Activity's BEAP and the Installation Appearance Plan.

**G204090 OTHER SITE IMPROVEMENTS**

[Provide dumpster pad.][Provide enclosure conforming to the Activity's BEAP and Installation Appearance Plan.][Provide double metal gate with self-closing mechanism.]

**G2050 LANDSCAPING**

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NOTE: Describe any special landscaping requirements such as screening of adjacent areas or roadways.  
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Provide complete landscaping consisting of [lawn] [groundcover] [trees] [shrubs] [perennials] [ornamental grasses] [organic mulches] and [inorganic mulches] to provide a quality, cost-effective, functional and visually appealing landscape program that will enhance the development, while complying with anti-terrorism, force protection and physical security requirements. Design the landscape to reinforce the facility entry and complement existing landscapes in the vicinity. [Provide a 5' wide (1.5 m) (minimum) inorganic rock cobble mulch setback (no vegetation) around the building]. [Provide landscaping resistant to deer.]

Guarantee landscaping for a period of [one year][\_\_\_\_\_] . Provide a [one year][ ] Establishment and Maintenance period. Landscaping Guarantee and Establishment and Maintenance periods must commence on the date that the inspection by the Contracting Officer shows that all landscaping under this contract has been satisfactorily installed.

Provide complete landscaping maintenance, including but not limited to, routine lawn mowing, edging, pruning, pest inspection/treatment, re-mulching of mulch products, watering, weeding, fertilizing, and restaking, throughout the guarantee period.

[Provide mechanical equipment screening wall on three sides of new equipment.]

Provide shrubs or small growing trees for screening of mechanical equipment/walls, dumpster enclosures, and other obstructions that do not present an aesthetic view from the street.

**G205001 FINE GRADING AND SOIL PREPARATION**

[Provide 4" of topsoil for lawn areas and fine grade.]

**G205002 EROSION CONTROL MEASURES**

Prevent erosion from occurring by providing erosion control measures as required by city, state and federal requirements.

**G205003 TOPSOIL AND PLANTING BEDS**

Provide a planting soil mixture composed of [100 percent topsoil] [50 percent native soil blended with 50 percent topsoil] [ ] around root balls of shrubs, trees, groundcovers, perennials, and ornamental grasses that is at a minimum, [twice as wide and equally as deep as the plant's root balls] [ ]. [Set tops of plant rootballs [2 inches (51 mm) above adjacent grades] [even with adjacent grades] [ ].

**G205004 SEEDING SPRIGGING AND SODDING**

[Seed][Sprig][Sod] areas indicated to be turfed in Part 6. Restore existing turf areas disturbed by Contractor operations that are to remain as turf areas. Restore by means of [seeding][sprigging][sodding] and provide same guarantee and maintenance as for new landscape areas. [Turfgrass species must match existing.]

**G205005 PLANTINGS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Describe any special planting requirements such as specific special areas to be planted, or if a specific number of plants are to be provided.  
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Preserve existing trees to the greatest extent possible. Select plant material from Master Plant Lists found within the Installation Appearance Plan (IAP). Other plants not found on these lists may be used if approved by the reviewing Government Landscape Architect. Final approval of new plant materials rests with the reviewing Government Landscape Architect.

[Provide a minimum of [\_\_\_\_\_\_] trees and [\_\_\_\_\_\_] shrubs for this project.]

[Provide small trees, shrubs, and ground cover plantings at building main entrances to accentuate the entrances.]

[Provide tree plantings throughout the site to frame the new building and lessen the visual impact of parking areas.] [Provide street trees that encompass the entire project site with an average spacing of 40 feet (12.2 m) on center.] [Street trees are required to be of [one] [ ] species.]

[Plant trees in parking lot islands.] [Trees planted in parking lot islands are required to be of [one] [ ] species.] [Plant trees in parking lots at the rate of [1] [ ] tree per 10 parking spaces.] [Screen proposed parking lots that can be seen from surrounding roadways or recreational areas with an evergreen shrub. Shrub size at installation must be a minimum height of [30 inches (762 mm)] [ ] and a minimum width of [24 inches (610 mm)] [ ] and planted [3 feet (.9 m)] [ ] on center.]

[For palm trees, identify sizes on plans by [brown trunk height (BTH)][clear trunk height (CTH)]. Unless otherwise approved by the reviewing Government Landscape Architect, provide minimum BTH or CTH of [8 ft. (2.4 m)][ ]].

If used for stormwater management, provide bioretention filters, plants, plant quantities, and soil mix in accordance with the State's Best Management Practices (BMP) Design Manual.

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NOTE: Where no state stormwater management regulations, laws or design manuals exist, update above and edit below.  
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[Provide trees and shrubs at the rate of 4 trees and 15 shrubs and/or ground covers per 1000 square feet (93 square meters) of bioretention filter.] [Compose bioretention filter soil mix of the following: [50 percent sharp sand, 30 percent topsoil, 15 percent double shredded hardwood mulch, and 5 percent peat moss] [ ] thoroughly blended.] [Provide triple shredded hardwood mulch at all bioretention filters.] [Provide river stone mulch at bioretention filters.] [Provide a 6 foot (1.8 m) wide grass sod border around the entire bioretention filter. Grass sod species must be [ ].] Ensure that the bioretention filters are not compromised by sediment deposits during construction. [Install bioretention filters only after upstream areas tributary to the bioretention filter location have been fully stabilized.]

[Provide [3 to 5 inch (76 mm to 127 mm)] [ ] diameter river stone mulch [over weed control fabric] at planting beds [adjacent to buildings]. [Provide stone mulch to a depth of [3 inches (76.2 mm)] [ ].

[Provide 3 inches (76 mm) of [shredded hardwood][ ] mulch [over weed control fabric] at planting beds.]

[Encompass planting beds not used for bioretention filters with [steel edging] [concrete edging] [ ].]

[Provide [6 inch (172 mm)][ ] wide by [12 inch (305 mm)][ ] deep concrete band [around rubberized surfacing][between asphalt paving and turf area][between asphalt paving and planting area][between asphalt paving and rock mulch/cobble area]]. [Provide 6 inch (172 mm) wide (minimum) concrete band edging for each of the following conditions: between rock mulch/cobble area and turf area, between rock mulch/cobble area and planting area, and between turf area and planting area]. [Contain turf areas adjacent to building walls, site walls, columns, stairs, and other structures by a 6 inch (172 mm) wide (minimum) concrete header with a minimum separation of concrete header from walls, columns, and other structures of [2 feet (0.6 m)][ ] to minimize damage to site improvements.]

**G205007 IRRIGATION SYSTEMS**

Provide a water conserving, highly efficient, automatic, below-grade irrigation system to irrigate landscaped areas with plantings. Use non-potable water sources whenever possible. Do not irrigate inorganic mulch beds that have no plants. Irrigate trees in separate zones from other plants. Irrigate turf in separate zones from other plants. [Do not utilize drip irrigation on this project].

Valve the irrigation system in accordance with exposure and plant evapotranspiration (ET) requirements. Irrigation controller must be compatible with existing central irrigation control system. [Provide rain shut-off and flow-sensing devices.][ Provide meters for irrigation systems using potable water. [Meter must be compatible with and monitored by the Direct Digital Controls (DDC) system]. Meter the irrigation system as close to main as possible and provide downstream irrigation backflow assembly.] [Provide annual estimated landscape water requirements (budget) with design submittals.] [Provide landscape irrigation audit prior to start of landscape establishment/maintenance period.]