



CITY OF ALEXANDRIA, VIRGINIA

# LANDSCAPE GUIDELINES





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## Preface

The 2019 update to the City's Landscape Guidelines is an update to the Landscape Guidelines originally adopted by City Council in 1997. Updated in 2007, the Landscape Guidelines set forth the drawing, implementation, and maintenance standards for landscape improvements on site plans and other plans that require approval by the City. The 2019 Landscape Guidelines shall apply to all Concept and Preliminary DSP and DSUP Plans submitted after March 1, 2019 and all Final #1 Grading Plans submitted after March 1, 2019.

The 2019 Landscape Guidelines update relocates the City's Standard Landscape Details, Plan Notes, Plant Lists, and Invasive Plant Lists to external links and references for such information found on the City's website. This allows City staff the maximum capability to maintain this information current with industry standards.

The information set forth in this document is the result of extensive outreach and coordination amongst various departments within the City. Acknowledgement is provided below for those whose expertise and participation was essential in updating this document to provide the highest quality standards for the City's landscapes.

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# 1 Introduction

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## About

The Landscape Guidelines are primarily intended for use by property owners, developers, and applicants seeking approvals of plans such as Grading Plans, Development Site Plans, Development Special Use Permits, and/or Special Use Permits within the City of Alexandria, Virginia. The document provides information regarding the expectations and procedures associated with these approval processes. This document is a guide to the City of Alexandria's landscape standards. The best practices and references in this document are also resources for all Alexandria residents and City projects (where applicable).

The Landscape Guidelines set minimum standards for landscape plans, installation of landscape improvements, and maintenance. The 2019 update builds upon the initial version in 1997 and first update in 2007 and aligns the City's standards with current industry best practices, recent changes to City policies and procedures, and includes new sections detailing the approval processes.

Information in the Landscape Guidelines is not intended to replace, but instead to supplement applicable codes, ordinances, and development procedures. In any given development application the City may require additional information, improvements, and plantings beyond the standards set forth herein.

## Authority and Ordinances

The Landscape Guidelines are enabled through the City of Alexandria's Zoning Ordinance (Section 11-410(CC)) in order to ensure that developments provide "adequate minimum landscaping." In the Zoning Ordinance, it establishes that "All landscaping ...shall be provided and performed as specified in guidelines," giving the Landscape Guidelines responsibility and purview over all development applications within the City. Further, the Zoning Ordinance establishes that the Landscape Guidelines will provide standards for planting that occurs both on-site and within the public right-of-way as a part of a development.

In addition to this section which establishes the role of the Landscape Guidelines, a separate section within the Zoning Ordinance provides the standards for the provision of tree canopy (or crown) coverage for development sites (Section 7-2507).

Together, these sections of the Zoning Ordinance provide the basis for the original Landscape Guidelines for the City of Alexandria and its updates.





# 2 Landscape Process

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## Process Overview

The Landscape Guidelines is an essential tool in preparation of plans that require the City's approval such as Grading Plans, Development Site Plans (DSPs), Development Special Use Permits (DSUPs) and major and minor site plan amendments. The Landscape Guidelines outline the standard landscape information required for each of the review processes and stages, and the methodology used to meet these requirements. As a result, proper implementation of the Landscape Guidelines contributes greatly toward achieving the City's social, economic and environmental goals in close coordination with other City plans and policies.

## Landscape Guidelines and Other City Standards

The Landscape Guidelines work in conjunction with a number of existing City plans, policies, and guidelines. For example, the Landscape Guidelines may be referenced within design guidelines that are specific to a Small Area Plan (SAP). Further, the Landscape Guidelines are a tool to implement the goals outlined in the City's Urban Forestry Master Plan, Open Space Plan, the Complete Streets Design Guidelines, and the Green Sidewalks Best Management Practices (BMP) Design Guidelines. These documents should be used together to ensure that all standards and requirements are met on a project. A summary of the role for each of these related documents and a link to access each is provided below:

[URBAN FORESTRY MASTER PLAN](#) The Urban Forestry Master Plan is a comprehensive urban forestry management plan that guides efforts in tree planting, tree care, management, and public education and outreach. The overarching goal of the Urban Forestry Master Plan is to increase the tree canopy throughout the City by better maintaining existing trees and adding a significant number of new trees through a series of specific recommendations outlined in the Plan.

[OPEN SPACE PLAN](#) The Open Space Plan establishes a framework for addressing Alexandria's short and longer term open space needs. It defines an approach that maximizes the City's limited open space opportunities by creating a system to serve the City's dense, urban condition. It begins by acknowledging and protecting the City's existing open spaces, and identifies additional open space opportunities for the future.

[GREEN SIDEWALKS BMP DESIGN GUIDELINES](#) The Green Sidewalks Best Management Practices (BMP) Design Guidelines are intended to aid the development community during design and construction of BMPs for treatment of stormwater runoff from the public right-of-way (ROW). The primary focus is to provide a design that achieves maximum improvements in water quality and issue guidance for the placement and aesthetics of above-grade BMPs. The guidelines are also intended for projects being administered by the City itself as it upgrades the public ROW.

[COMPLETE STREET DESIGN GUIDELINES](#) The Complete Street Design Guidelines are intended to ensure that all Alexandria's streets meet the needs of all users, including pedestrians, bicyclists, transit users, drivers, residents, workers, and business owners. These guidelines are intended to be flexible and responsive to unique site circumstances. In all cases, street design will be subject to staff approval based on these guidelines.

[ENVIRONMENTAL ACTION PLAN](#) The Environmental Action Plan 2030 (EAP) is the City's comprehensive blueprint for creating a thriving, sustainable community. In June 2009, the City adopted the EAP, which aimed at achieving the vision and principles outlined in the City's Eco-City Charter and ensuring the City continues to move toward environmental sustainability. The EAP Phase One Update established short-term goals and action items for five key focus areas and concluded October 2018. The EAP Phase Two Update will address the remaining five focus areas and develop mid-term and long-term goals for all ten areas.



# 3

## Standards for All Projects Requiring Approval

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## Standards for All Projects Requiring Approval

The information provided herein are standards that apply to all projects requiring approval by the City of Alexandria. These approval processes include Grading Plans, Special Use Permits (SUPs), Development Site Plans (DSPs), Development Special Use Permits (DSUPs), and Major and Minor Site Plan Amendments. Additional standards and process information for DSPs and DSUPs are covered in Chapters 4 and 5.



# General Drawing Standards

## OVERVIEW

All landscape plan submissions shall consist of the information outlined in Chapter 3 of the Landscape Guidelines and comply with the drawing standards listed in this chapter. The drawing standards provided herein are intended to streamline the review process and ensure quality and accuracy in communication of the landscape plan information. In the event that conflicts occur between the Landscape Guidelines and the City's plan preparation checklists, the standards of the Landscape Guidelines shall apply.

## LANDSCAPE DRAWING STANDARDS

The following information provides the standards for drawing and preparing landscape plans.

1. **Landscape drawings shall be prepared at an industry standard architecture or engineering reference scale.**
  - a. The minimum scale shall be one (1) inch equals thirty (30) feet and/or at a scale consistent with site engineering documents.
  - b. Drawings at an enlarged scale shall be provided for areas or conditions that require additional information and an enhanced level of detail.
2. **Geodetic or plan-north of the landscape plan shall be oriented consistently with site engineering and architecture documents.**
3. **To accurately represent crown area of plantings proposed in the landscape plan drawings, circles, vegetation symbols or other representations shall graphically differentiate between shade, ornamental and evergreen trees and be drawn to scale using the following dimensions for representation:**
  - a. All trees and shrubs: sixty (60) percent of the total mature spread
4. **Landscape drawings shall show and describe all site conditions including buildings, pervious and impervious areas, parking, service areas, emergency vehicle access, site furnishings, site and street lighting, natural areas and open space in relationship to site development. Landscape drawings shall consist of sufficient detail and of professional quality to enable comprehensive review.**

## LANDSCAPE PLAN SUBMISSION REQUIREMENTS

1. All landscape plan submissions shall include, but not be limited to, documentation of the following:
  - a. Existing Conditions Plan:
    - i. Limits of project site, property line(s), and context including neighboring sites, vegetation, Resource Protection Areas (RPAs), and buffers.
    - ii. Location(s) of above and below grade site utilities and service connections including Fire Department Connections, easements and access requirements.
    - iii. Location(s) and direction(s) of service openings on above grade utilities such as transformers, telephone, air conditioning/heating units and cable boxes. Specifically indicate perimeter clearance/safety zones.
    - iv. Slope areas in excess of four-to-one (4:1) or twenty-five (25) percent.
  - b. Proposed Landscape Plan:
    - i. Limit of project site and property line(s.)
    - ii. All land disturbing activities and limits of disturbance (LOD), including utility work.
    - iii. Phasing, future development, temporary uses and timing of construction if applicable.
    - iv. Location, size, and species of proposed vegetation.
    - v. Grass areas and limits, including identification of sod and/or seed areas.
    - vi. Drainage ways, yard inlets, area drains and overflow areas.
    - vii. Locations(s) of stormwater BMPs.
    - viii. Location(s) of above and below grade site utilities and service connections including Fire Department Connections, easements and access requirements.
    - ix. Location(s) and direction(s) of service openings on above grade utilities such as transformers, telephone, air conditioning/heating units and cable boxes. Specifically indicate perimeter clearance/safety zones.
    - x. Specification and location for landscape accessories such as temporary or moveable planters, street and site lighting, site furnishings, paving, pervious emergency vehicle access, etc.
    - xi. Landscape irrigation/water management system.
    - xii. Existing, required and proposed open space, and/or applicable contributions in feet and acres.
    - xiii. Vision clearance areas/zones for vehicles, pedestrians and traffic control devices.
    - xiv. All necessary dimensions, distances, quantities and clearances required by the Zoning Ordinance and/or Code.
  - c. A plant legend/index or schedule that indicates the plan species with botanic and common names, height/size, and total quantity of all proposed plantings at time of installation.
  - d. A chart which summarizes the species and genus standards as outlined in Specification of Plant Species.
  - e. A chart which summarizes the native plant standards as outlined in Specification of Plant Species.

- f. Planting details including dimensioned design sections and specifications for all proposed work, including location, details and specifications for all ground level work, tree wells, landscape strips and plantings above structure.
- g. Standard landscape plan notes required on all landscape plan submissions.

## PREPARATION AND CERTIFICATION OF DOCUMENTS AND DRAWING SUBMISSIONS

1. All landscape documents, drawing submissions, specifications and as-built documents shall be prepared, sealed and dated by a Landscape Architect licensed to practice in the Commonwealth of Virginia.
2. The Tree and Vegetation Surveys and Tree and Vegetation Protection Plans shall be prepared by an Arborist professionally certified by the International Society of Arboriculture (ISA), or an Arborist professionally registered with the American Society for Consulting Arborists (ASCA).
3. All landscape irrigation/water management documents, drawing submissions, specifications and as-built documents shall be prepared and sealed by an Irrigator with Class certification commensurate with the subject project type in the Commonwealth of Virginia.



# Tree and Vegetation Survey

## OVERVIEW

The City of Alexandria requires the planting and maintenance of trees on all developments to garner the stormwater, ecological, aesthetic, and community benefits provided by a healthy urban forest. Many of these benefits are realized when trees reach maturity and are maintained in good health.

Therefore, it is a priority for the City that all projects preserve existing, healthy trees and other vegetation to the greatest extent feasible. In order for the City to analyze the quality of existing vegetation, the potential impacts to such vegetation, and provide credit for the preservation of existing trees on-site, a thorough survey documenting existing trees and other vegetation on and adjacent to a project site is required.



## TREE AND VEGETATION SURVEY PLAN PREPARATION

1. A Tree and Vegetation Survey is required for all projects. The survey shall be prepared by an Arborist professionally certified by the International Society of Arboriculture (ISA) or an Arborist professionally registered with the American Society for Consulting Arborists (ASCA), and must inventory and identify trees on the project site and within fifteen (15) feet from the subject property line using accepted industry standards. The Tree and Vegetation Survey shall include:
  - a. Survey Plan Information:
    - i. Location of individual trees and shrub massings in relationship to site topography/grade conditions.
      1. All trees that are six (6) inches diameter and greater measured at fifty-four (54) inches above ground level in natural areas shall be inventoried.



2. If disturbance occurs within a Resource Protection Area (RPA), trees to be removed within the disturbed portion of the RPA buffer area shall be inventoried at ½ inch diameter and greater, and all shrubs to be removed within the disturbed portion of the RPA buffer shall be inventoried at three (3) feet in height and greater.
3. All trees over two (2) inches diameter shall be inventoried in cultivated landscapes.
4. All shrub massings over two (2) feet in height shall be inventoried in cultivated landscapes.
- ii. Extent of critical root zone for individual trees and/or groups of trees (refer to City Standard Details).
- iii. The existing grade elevation at base of tree trunk and at the edge of the critical root zone of the tree.
- iv. Site topography / contours in two (2) foot increments
- v. The project limits of disturbance (including all proposed utility work).
- b. Survey Inventory Information:
  - i. Tree size documented according to AmericanHort (formerly American Nursery & Landscape Association) standards.
  - ii. Health of each tree, using the Plant Health component of the most recent version of the Council for Tree and Landscape Appraisal (CTLA) Tree Condition Rating System.
  - iii. Where trees are located near the edge of the Limits of Disturbance or Tree Protection Area, provide notations regarding the likelihood of the tree's ability to survive construction activity.
  - iv. Shrubs massings sized by height (with species, including botanic and common names).
  - v. Individual plants or groups of listed invasive species.

## SPECIAL CONDITIONS

1. **Densely wooded, environmentally sensitive or ecologically important sites may require additional extensive and detailed study conducted by professional consultants with subject matter expertise.**
2. **Specimen trees or vegetation will require:**
  - a. An assessment of physical attributes and features and biotic systems, if required by the City.
  - b. Note: Specimen trees are trees that are of a notable size for their species and/or have a high-quality health assessment or display a particularly appealing aesthetic appearance. Trees may also be designated specimens based on advanced age or association with historical events.

# Invasive Species Removal and Management Plan



## OVERVIEW

Established invasive species populations pose considerable threats to surrounding sites. These populations create seed banks that impact adjacent properties or spread by other dispersal means. Soil disturbance during construction activities creates favorable habitats for invasive plants for years following the completion of projects while plant communities are establishing.

An Invasive Species Removal and Management Plan shall be prepared, as applicable, for all projects that require City approval and shall include the information described in this section at a minimum for review. In the event that there are conflicts between the Landscape Guidelines and the City's plan checklists, the Landscape Guidelines shall apply.

## INVASIVE SPECIES REMOVAL AND MANAGEMENT PLAN REQUIREMENTS

To determine if an Invasive Species Removal and Management Plan is necessary, a current inventory of invasive species shall be conducted with the Tree and Vegetation Survey. Surveys shall be prepared according to best management practices and shall include trees, shrubs, and other vegetative material.

Sites with significant populations of invasive species or, sites with steep slopes and sites adjacent to natural areas or stream corridors, which are particularly susceptible to damage from invasive species, may necessitate a Removal and Management Plan.

1. If the survey demonstrates any of the following, submit an Invasive Species Removal and Management Plan:
  - a. Ten (10) percent of the site is covered with invasive species as identified in the invasive species resources listed within Chapter 6.
  - b. Location of invasive species within seventy-five (75) feet of a natural area, shoreline or stream corridor.
  - c. Un-stabilized slopes graded steeper than two-to-one (2:1).

## INVASIVE REMOVAL AND MANAGEMENT PLAN PREPARATION

1. If it is determined that an invasive species removal and management plan is necessary, include the following information on the plan:
  - a. The location and areas (in square feet) of invasive species identified.
  - b. The botanical and common name of the invasive species.
  - c. Risks posed by invasive species for the project site and adjacent properties.
  - d. Removal and management methods.
  - e. Monitoring and management plan after completion of construction.

**2. The Invasive Species Removal and Management Plan shall include a list of control/management strategies for each target species.**

- a. Control and management strategies may include biological, mechanical, and/or chemical.
- b. Multiple strategies may be necessary based on the invasive species survey, but should be targeted towards specific species.
- c. Include the following items for each strategy:
  - i. Techniques proposed
  - ii. Schedule of control measures
  - iii. Required resources
  - iv. Invasive monitoring and management measures

**3. Monitoring and Management**

- a. Projects requiring a DSP or DSUP, where an Invasive Species Removal and Management Plan is deemed necessary shall provide the following:
  - i. An invasive species monitoring and management plan report shall be prepared each year beginning at the issuance of the first Certificate of Occupancy until the release of the Maintenance Bond.
  - ii. The reports shall compare the baseline inventory completed with the Tree and Vegetation Survey to current conditions annually. The annual reports shall be submitted to the City at the time of Maintenance Bond inspection.

# Tree and Vegetation Protection Plan

## OVERVIEW

Upon completion of the Tree and Vegetation Survey and Invasive Species Removal and Management Plan (if necessary), areas of healthy, non-invasive vegetation may be identified for preservation. The intent of the Tree and Vegetation Protection Plan is to locate and specify the appropriate method of tree protection to ensure survivability of trees to be preserved during and following construction.

## TREE AND VEGETATION PROTECTION METHODS AND PROCEDURES

1. **Vegetation designated for preservation shall be enclosed in a protection area that establishes limits of construction disturbance to the Critical Root Zone (CRZ) of designated plant material.**
  - a. The protection zone must be delineated with tree protection fencing pursuant to City Standard Details.
  - b. Where it is impractical to provide a protection zone at the limits of the CRZ and the project arborist determines that the tree is likely to survive construction activity and disturbance, the tree protection zone shall be no less than eight (8) feet from the vegetation to be protected.
  - c. Silt, erosion control or geotechnical fabric materials are not acceptable for use as tree protection fencing.
  - d. For specially designated, specimen quality, historic, or culturally significant vegetation, refer to the section on Critical Design Considerations.
2. **Protection methods for street trees to be preserved shall be installed pursuant to the relevant details provided in Chapter 6. The City Standard Landscape Details.**
3. **Additional tree protection measures and methods are encouraged. It is recommended that such measures be prepared by the project arborist and provided with the Tree and Vegetation Protection Plan for review by the City.**
4. **When proposed development impacts existing vegetation within a Resource Protection Area (RPA) provide the following:**
  - a. Water Quality Impact Assessment (WQIA) to be approved by the City.
  - b. An approved revegetation plan or supplement to the landscape plan as required by the WQIA consistent with the practices found in the Virginia Riparian Buffer Modification and Mitigation Guidance Manual.

## TREE AND VEGETATION PROTECTION PLAN PREPARATION

1. **When surveyed trees and/or other vegetation is to be preserved, the applicant shall retain an Arborist professionally certified by the International Society of Arboriculture (ISA), or an Arborist professionally registered with the American Society for Consulting Arborists (ASCA) to prepare the Tree and Vegetation Protection Plan and provide methods and recommendations for protection and preservation of existing vegetation.**
2. **The Tree and Vegetation Protection Plan shall indicate:**
  - a. Individual trees and/or groups of trees and shrubs To Be Saved (TBS) and To Be Removed (TBR) on-site and within fifteen (15) feet from the subject property line.
  - b. Extent of critical root zone for individual trees and/or groups of trees to be saved.



- c. Location(s) of tree protection fencing.
  - d. Tree protection details and other methods of tree preservation such as root pruning.
  - e. The project limits of disturbance (including all proposed utility work).
  - f. Location(s) of all proposed foundations or structures.
  - g. Structures or site elements (driveways, sidewalks, etc.) to be demolished.
3. **Vegetation protection zones shall be depicted and documented on all development related drawings/sheets that depict work affecting the protection and preservation of existing vegetation, including demolition, sediment and erosion control, sheeting and shoring, site layout, landscape plantings, and dimension plans.**
4. **Vegetation on Neighboring Property: When development proposes disturbance within the CRZ of existing vegetation located on or within fifteen (15) feet of the subject property line, the following information must be provided prior to application of a building permit:**
- a. A letter provided to the neighboring property owner(s) that includes:
    - i. Notification of construction impacts and potential for loss or damage to existing trees on the neighboring property.
    - ii. Timing, scheduling, and/or phasing of the project.
    - iii. Proposed mitigation and remedial measures should loss or damage occur.
  - b. Certified proof of delivery for the letter(s) shall be provided to the City.

- c. The neighboring property owner(s) must notify the City and the applicant of issues or concerns with the proposed mitigation and remedial measures within ten (10) business days of receipt of the letter.
  - i. If concerns are raised by a neighboring property owner within this timeframe, the applicant and the neighboring property owner shall work together to achieve a mutually agreed upon approach for mitigation of damage to the trees and proposed remedial measures.
  - ii. If the applicant and/or the City is not contacted by a neighboring property owner within this timeframe, the mitigation and remedial measures proposed by the applicant shall be considered accepted by the neighbor.

## CONSTRUCTION ACTIVITY AND MAINTENANCE

1. **Vegetation designated for protection and/or preservation shall continuously receive an enhanced level of maintenance throughout the entire construction period.**
  - a. Maintenance shall be pro-active.
  - b. Maintenance operations shall aggressively monitor the health, growth and vigor of vegetation and prescribe selective pruning, removal of volunteer and/or invasive species, watering, fertilization and installation of mulch/topdressing.
  - c. When preserved vegetation is located on City property, maintenance shall be performed to the satisfaction of the City.
2. **Areas designated for protection and/or preservation of vegetation shall not be entered or utilized (approved maintenance procedures and watering excepted) throughout the entire construction period. Prohibited items/activities include, but are not limited to:**
  - i. Modifying site topography in a manner that directly or indirectly alters existing site drainage within protection zone including trenching or grading operations and placing, storing or stockpiling soil or construction related supplies.
  - ii. Felling and storing vegetation.
  - iii. Incinerating materials within or in close proximity.
  - iv. Operating machinery or equipment, including vehicle/equipment parking or storage.
  - v. Temporary or permanent utility construction, paving or impervious surface installation.
  - vi. Disposal of debris or chemicals.
  - vii. Temporary facilities or occupation by work force.
  - viii. Storage of construction materials or waste.

## REPLACEMENT OF DAMAGED VEGETATION

1. At determination of the City, egregious or severe damage to vegetation identified to be preserved shall require an additional review of the project's approval. Amendment procedures may be required.
2. Where vegetation identified to be preserved is damaged as a result of construction activity, an in-kind replacement of damaged vegetation shall be performed in accordance with the following standards:
  - a. Damaged Trees:
    - i. A fine shall be levied on the Developer based on the diameter of the damaged tree at fifty-four (54) inches above ground level. A fine of \$2,500 (as an equivalent to the planting cost of a large shade tree), per sum total caliper inch of the damaged tree shall be paid. The maximum fine amount shall be \$50,000 per tree.
      1. One (1) Category IV tree per caliper inch of the sum total caliper inch measurement of tree(s) deemed severely or terminally damaged may be planted on-site or at a location specified by the City as a partial payment of the above fine, on a case-by-case basis at the determination of the City.
      2. The fine shall be paid to the following
        - a. The property owner of the adjacent property where the tree to be protected was located.
        - b. In all other cases, the fine shall be paid to the City of Alexandria.
  - b. Damaged shrubs:
    - i. An installation of comparable size and quantity to the satisfaction of the City.
3. Applicant, owner or successor liability for replacement of damaged vegetation shall extend until the release of the project's maintenance bond or three years from the date of the issuance of the Certificate of Occupancy for Grading Plans.



# Canopy Coverage

## OVERVIEW

Under City Zoning Ordinance (Article VII – Section 7-2507) any construction project requiring a Grading Plan or a Development Site Plan (DSP or DSUP) (Article XI – Section 11-410) must provide a minimum of twenty-five (25) percent vegetated canopy cover for the site through conserved vegetation or as calculated at maturity for any new plantings.

Crown Coverage Allowances are designated herein for shade, ornamental and evergreen trees, shrubs and bioretention plantings. The

designated Crown Cover Allowances are determined through actual study of the average spread and traditional growth performance of trees typically planted in Alexandria, Virginia and calculated for the expected canopy coverage at twenty (20) years. Further, tree species are grouped into four (4) different categories based upon the anticipated species size of the tree at maturity.

Urban environments create challenging conditions for sustaining growth and vigor of vegetation when compared to natural areas. Due to these challenges and the many benefits that mature trees provide, preservation of existing mature trees is encouraged through bonus Crown Coverage Allowance (CCA).



## CANOPY COVERAGE STANDARDS

1. **Bonus Crown Coverage Allowance - Preservation:** Where a healthy, non-invasive tree is in fair, good, or excellent health condition as determined in accordance with the current Council for Tree and Landscape Appraisal (CTLA) Tree Condition Rating System and measures to a size greater than or equal to eighteen (18) inches in diameter at fifty-four (54) inches above the ground level is preserved on-site, with no impact within the critical root zone, a bonus Crown Coverage Allowance will be awarded up to one and one-half (150%) actual canopy area at the time of submission.
2. **Proposed Trees:** Categories for tree canopy area are based upon the anticipated species size at maturity when located in an urban environment.
  - a. Category I Trees = 250 CCA: Will reach a mature spread of 18 feet
  - b. Category II Trees = 500 CCA: Will reach a mature spread of 25 feet
  - c. Category III Trees = 750 CCA: Will reach a mature spread of 30 feet
  - d. Category IV Trees = 1,250 CCA: Will reach a mature spread of 40 feet



3. **Shrubs: Categories for shrub canopy area are based on the anticipated species height at maturity when located in an urban environment. Shrub plantings shall not exceed twenty-five (25) percent of a site's total canopy cover requirement.**
  - a. Category I Shrubs = 2 CCA: Will reach a mature spread of at least 2 feet and up to 3 feet
  - b. Category II Shrubs = 10 CCA: Will reach a mature spread greater than 3 feet and up to 6 feet
  - c. Category III Shrubs = 25 CCA: Will reach a mature spread greater than 6 feet and up to 15 feet
  - d. Category IV Shrubs = 50 CCA: Will reach a mature spread greater than 15 feet
4. **Plant Specification: Refer to Chapter 3. Specification of Plant Species and Chapter 6. Recommended Plant Lists.**
  - a. Where plants that are not identified on the Plant Lists are proposed, an equivalent Canopy Coverage Allowance will be assigned by the City based upon the anticipated species size at maturity when located in an urban environment.
5. **Ornamental grasses, perennial plantings, groundcovers, and turfgrass do not apply toward Crown Coverage Allowances.**
6. **Bioretention Planting: Trees and shrubs in bioretention areas shall follow the CCA standards described above.**
7. **Plantings On-structure: Plantings above structure (such as rooftop amenity spaces, parking garages, decks and plazas) have additional challenges to thrive and fully mature; therefore, the following standards shall apply:**
  - a. The Crown Coverage Allowance for trees and shrubs on-structure shall be one-hundred (100) percent of the designated allowance where soil volume minimums have been met.
  - b. No credit shall be given for trees and shrubs where soil volume minimums are not met.
8. **Street Trees: Street trees or other plantings in public Right-of-Way (ROW) do not apply toward Crown Coverage Allowances unless a modification is approved by the Planning Commission.**
9. **Modification to Crown Cover Requirements: A modification of the minimum crown cover requirement may be requested pursuant to the following:**
  - a. In addition to the criteria set forth in [Section 11-416](#), which is used by the Planning Commission to determine that such modification is necessary, the Planning Commission may also consider the following points in review of a modification request specific to the reduction of the required minimum canopy cover:
    - i. Site constraints such as steep slopes, an irregular-shaped site, or existing utilities that limit the amount of planting.
    - ii. The balance of usable versus planted/landscaped open space: such as additional planting areas with trees or shrubs that would exclude seating areas, recreation, and/or gathering spaces.
  - b. Fee in lieu: The portion of the required canopy cover for which a modification is approved shall be required to pay a fee in lieu to be dedicated for off-site planting facilitated by the City. A fee in the amount of two dollars (\$2) per square foot of crown coverage deficient of meeting the site's canopy cover requirements shall be provided to the City's Department of Recreation, Parks and Cultural Activities Urban Forestry Fund.

# Sizing and Sourcing Plant Material

## OVERVIEW

Plant material specified on a site and within the public ROW is defined and detailed in the landscape plans. The plant material specified will play an important role in defining the character of the site and delivering a functional space with environmental benefits to the City. It is important that this material be of sufficient size, quality and of appropriate specification for site conditions to help maximize longevity of the plant material, garner the environmental benefits, prevent the spread of insects and diseases, and ensure public safety.

## PLANT MATERIAL STANDARDS

1. **Specification for all plantings shall be in accordance with the current and most up to date edition of ANSI-Z60.1, The American Standard for Nursery Stock as produced by AmericanHort (formerly American Nursery & Landscape Association).**
2. **All plant material shall be meet the following criteria:**
  - a. Provenance of plant material must be from within the following states:
    - i. Virginia, Maryland, District of Columbia, Pennsylvania, Delaware, New Jersey, West Virginia, North Carolina, and eastern Tennessee (east of Knoxville)
  - b. Wild-collected plant material is not acceptable except in the case of transplanted material within the project site.
3. **Trees shall be specified according to the following requirements:**
  - a. Category I and II Trees:
    - i. Ornamental trees shall be planted at a caliper size between 1.5 inches and 1.75 inches and between six (6) feet and ten (10) feet in height.
    - ii. Multi-stem trees shall be planted at a minimum height of six (6) feet.
    - iii. Evergreen trees shall be planted at a minimum height of six (6) feet.
  - b. Category III and IV Trees:
    - i. Shall be planted at a minimum caliper size between two (2.0) inches and three (3.0) inches and between twelve (12) feet and fourteen (14) feet in height.
4. **Shrubs and Ornamental Grasses:**
  - a. Minimum shrub height at time of installation shall be eighteen (18) inches.
  - b. Ornamental grasses shall be a minimum size of one (1) quart at the time of installation.
  - c. Shrubs and ornamental grasses planted within the public ROW shall not exceed a mature height of thirty (30) inches.
5. **Groundcover and Perennials:**
  - a. Specify and install at a spacing and size to achieve seventy-five (75) percent uniform coverage of the overall design intent prior to the end of the Maintenance Bond period.
  - b. Species planted within the public ROW shall not exceed a mature height of thirty (30) inches.

6. Turfgrass specification (sod and seed) shall be of superior specification as approved and certified by the Virginia Department of Agriculture, Virginia Cooperative Extension Service and/or University of Maryland.
  - a. Sod:
    - i. Of a uniform non-varying density and continuous texture quality capable of growth and development immediately upon installation.
    - ii. Specified from varieties listed on the current Virginia Turfgrass Variety Recommendations from the Virginia Cooperative Extension or University of Maryland Recommended Turfgrass Varieties
  - b. Seed:
    - i. Procure from new of the year seed crops, free of foreign material or weed seeds.
    - ii. Replacement or overseeding mixes shall match or complement original installation.
    - iii. Provide continuous uniform and consistent coverage.
    - iv. Shall be 'blue tag' certified by the Virginia Crop Improvement Association (VCIA) to be free of noxious weeds, non-turfgrass plants, unspecified growth, and soil borne insects and disease.
    - v. Shall be listed on the current Virginia Turfgrass Variety Recommendations from the Virginia Cooperative Extension or the Maryland Recommended Turfgrass Varieties.



# Specification of Plant Species

## OVERVIEW

The selection of species for planting on public and private sites within the City of Alexandria is fundamental to the success of projects and the City's landscape overall. Selecting an appropriate plant leads to a thriving landscape with all of the inherent community and ecosystem services, and contributes to the aesthetic identity of Alexandria. Conversely, an inappropriate choice can lead to the spread of pests and diseases or invasive plants, costing resources and becoming a detriment to the appearance and function of our lands. To ensure appropriate selections, this section provides standards for sufficiently diverse plantings, minimum percentages of native species, and prevention of the use of invasive species.

## SPECIES SPECIFICATION STANDARDS

### 1. Biodiversity Standards

Both historically and in the present day, communities across the United States have suffered catastrophic losses of tree canopy cover due to new pests flourishing within plantings of limited diversity. In order to provide for the viability, health, and ecosystem benefits of the urban forest and landscape plantings of Alexandria, while reducing the impacts of pests, diseases, and inclement weather, a biodiversity specification is necessary to ensure that the landscape plantings within the City increase and maintain the diversity of plant species.

Widely accepted as a best-practice among the arboriculture and forestry professions, the use of percentages or ratios of the use of plants within a species and genus has been proven effective as pests and diseases tend not to effectively cross genus lines, and in many cases may be specific to species.

#### a. Percentage of Species and Genus in Planting Plans

##### i. The following diversity standards shall apply to tree and shrub plantings.

##### 1. Ten (10) percent at the species level (maximum)

a. A single species of plant may not represent more than ten (10) percent of the plant type (trees, shrubs) utilized in the plant lists or plantings.

i. Example: *Quercus palustris* (palustris is the species name) – Pin Oak would constitute no more than ten (10) percent of the trees within a plant list for a project.

##### b. Exceptions:

i. Where ten (10) trees or less are provided on a site, the maximum percentage of a tree species may be thirty-five (35) percent.

ii. Where three species are used under a single genus, the maximum percentage of a species may be increased up to 13% to fulfill the 33% genus maximum.

##### 2. Thirty-three (33) percent at the genus level (maximum).

- a. A single genus may not represent more than thirty-three (33) percent of the plant type (trees, shrubs, etc.) utilized in the plant lists or plantings.
    - i. Example: *Quercus* (Oak genus) would constitute no more than thirty (33) percent of the trees within a plant list. A number of species of oak trees could be used under this genus, but no fewer than three oak species for a maximum of ten (10) percent for each species (See species exceptions above).
  - b. Exceptions: Where ten (10) trees or less are provided on a site, the maximum percentage of the genus of the trees may be fifty (50) percent.
  - b. Trees and shrubs used solely within stormwater BMP facilities are not required to meet the diversity standards above. However, BMP plant material should strive to meet the standards to the maximum extent practicable.
  - c. Trees, shrubs and groundcovers used on green roofs are not required to meet the diversity standards above. However, plant material should strive to meet the standards to the maximum extent practicable.
  - d. Provide additional columns on all plant lists to indicate the representative percentages associated with the species and genus or per the table provided in the City Standard Details.
- 2. Native Species Standards**

A growing body of knowledge is documenting the benefit of utilizing native species of plants rather than exotic species. These benefits range from benefits to waterway health, wildlife diversity, reductions in water use and synthetic inputs, adaptation to local conditions of soils and climate, and beyond. These benefits are not limited to natural areas, but can also be realized across the spectrum of natural to urban landscapes. However, urban planting areas can offer very unique and challenging conditions for which native plants have not developed adaptations. Due to this, these Landscape Guidelines recognize that the blanket specification of native species for all plants and all situations may not be beneficial to the health and vitality of the Alexandria landscape. Additionally, the standards address the current status of species availability in the nursery industry, particularly by offering a phased approach for the various plant types (trees, shrubs, etc.) that allows time for the industry to adjust to these standards and shift their practices to greater provision of native species.



## a. Definitions

- i. Per the United States Department of Agriculture (USDA) Natural Resources Conservation Service, a native plant is: “A plant that is a part of the balance of nature that has developed over hundreds or thousands of years in a particular region or ecosystem. Only plants found in this country before European settlement are considered to be native to the United States.”
- ii. For additional clarification, a native plant is: A plant that lives or grows naturally in a particular region without direct or indirect human relocation from outside the designated area.
- iii. For the purposes of specifying plants within the City of Alexandria, the following definitions/categories of native plants shall be utilized.

## 3. Eastern U.S. Native

- a. Plants that are native (using the primary definition above) to the United States, east of the Mississippi River.

## 4. Regionally Native

- a. Plants that are native (using the primary definition above) to the states of Virginia, West Virginia, Maryland, Delaware, North Carolina, and Pennsylvania.

## 5. Locally Native

- a. Plants that are native (using the primary definition above) to the Piedmont and/or Coastal Plain (Tidewater) area of Northern Virginia, generally circumscribed by Northern Virginia including the area within the City of Alexandria and the following counties: Fairfax, Arlington, Prince William, Loudoun, Fauquier, and Stafford.

- b. Plantings within Areas of Special Designation: The areas provided herein require the use of Regionally Native or Locally Native for all plant types, with a preference for maximizing the use of Locally Native plants whenever practicable.

## i. Resource Protection Areas (RPAs)

1. RPAs must be planted according to the direction of the Virginia Riparian Buffers Modification and Mitigation Guidance Manual or the satisfaction of the Director of Transportation and Environmental Services (T&ES).

## ii. Stormwater BMPs, with the exception of vegetated roofs.

1. Vegetated roofs may use non-native, non-invasive plants. Eastern US Native, Regionally Native or Locally Native Plants should be used whenever practicable.
2. Stormwater BMPs must be planted according to the direction of current Memos to Industry, the Virginia Stormwater BMP Clearinghouse or the satisfaction of the Director of T&ES.

## iii. Natural Lands Management Projects

1. Natural Lands Management Projects must be planted according to the direction of current Memos to Industry or to the satisfaction of the Director of RPCA.

### NATIVE PLANT STANDARDS

| PLANT TYPE                            | NATIVE TYPE                  | MARCH 2, 2019 – JANUARY 1, 2020 | JANUARY 2, 2020 – JANUARY 1, 2024 | BEGINNING JANUARY 2, 2024                 |
|---------------------------------------|------------------------------|---------------------------------|-----------------------------------|---|
| Urban Trees                           | Regionally or Locally Native | 10%                             | 15%                               | 20%                                       |
|                                       | Total Natives                | 25%                             | 25%                               | 50%                                       |
| Standard Trees                        | Regionally or Locally Native | 15%                             | 25%                               | 40%                                       |
|                                       | Total Natives                | 40%                             | 60%                               | 80%                                       |
| Evergreen Shrubs                      | Regionally or Locally Native | 5%                              | 8%                                | 10%                                       |
|                                       | Total Natives                | 20%                             | 30%                               | 40%                                       |
| Deciduous Shrubs                      | Regionally or Locally Native | 10%                             | 15%                               | 20%                                       |
|                                       | Total Natives                | 40%                             | 60%                               | 80%                                       |
| Groundcovers                          | Regionally or Locally Native | 5%                              | 10%                               | 10%                                       |
|                                       | Total Natives                | 10%                             | 20%                               | 20%                                       |
| Perennials, Ferns, Ornamental Grasses | Regionally or Locally Native | 10%                             | 15%                               | 25% (perennials)<br>30% (ferns & grasses) |
|                                       | Total Natives                | 25%                             | 40%                               | 60% (perennials)<br>80% (ferns & grasses) |
| Vines                                 | Total Natives                | 80%                             | 100%                              | 100%                                      |

**NOTES:**

- 1) Percentages apply to the total quantity of each plant type specified on Completeness/Preliminary Plans and Final #1 Grading Plans submitted during the listed time frames.
- 2) Total Natives is the sum of Eastern U.S. Native, Regionally Native, and Locally Native vegetation specified on the plans for each plant type.
- 3) Non-native vegetation for the purposes of providing edible fruits, seeds, or nuts may be planted and shall not be calculated in the above-stated requirements for native species regardless of plant type.

- c. Trees: As the largest contributor to the canopy cover of the City of Alexandria, the specification of native trees has a significant impact on the ecosystem services specific to native species and contribute to a uniquely identifiable aesthetic to the City. In planting areas that are constrained by the percentage of impervious surface and/or volume of soil available (“urban plantings”), the use of non-native tree species may be beneficial to provide a diverse choice of species that can thrive in such conditions.
- i. Urban Trees: Urban trees are where the majority of the surface within the projected 20-year canopy area of the tree is impervious. Examples may include street trees and plaza plantings.
    1. From adoption of the updated Landscape Guidelines to January 1, 2020, a minimum of twenty-five (25) percent of trees specified within Urban Plantings must be native species, per the provided species list.
      - a. A minimum of ten (10) percent must be Regionally or Locally Native.
    2. From January 2, 2020 to January 1, 2024, a minimum of thirty-five (35) percent of trees specified within Urban Plantings must be native species, per the provided list<sup>1</sup>.
      - a. A minimum of fifteen (15) percent must be Regionally or Locally Native.
    3. Beginning January 2, 2024, a minimum of fifty (50) percent of trees specified within Urban Plantings must be native species, per the provided species list<sup>1</sup>.
      - a. A minimum of twenty (20) percent must be Regionally or Locally Native.
  - ii. Standard Trees (Non-urban):
    1. From adoption of the updated Landscape Guidelines to January 1, 2020, a minimum of forty (40) percent of all trees specified must be native species, per the provided species list.
      - a. A minimum of fifteen (15) percent must be Regionally or Locally Native.
    2. From January 2, 2020 to January 1, 2024, a minimum of sixty (60) percent of all trees specified must be native species, per the provided species list.
      - a. A minimum of twenty-five (25) percent must be Regionally or Locally Native.
    3. Beginning January 2, 2024, a minimum of eighty (80) percent of all trees specified must be native species, per the provided species list.
      - a. A minimum of forty (40) percent must be Regionally or Locally Native.
    4. Non-native trees for purposes of providing edible fruits, seeds, or nuts (ex. apples, figs) may be planted and would not be calculated in the above-stated requirements for native species.
- d. Shrubs
- i. Evergreen shrubs
 

Evergreen shrubs provide a desirable aesthetic contribution to the cultural landscape, however the number of native evergreen shrub species that are adapted to the growing conditions of the City of Alexandria are limited. Due to this, a higher percentage of non-native evergreen shrubs are allowed.



1. From adoption of the updated Landscape Guidelines to January 1, 2020, a minimum of twenty (20) percent of all evergreen shrubs specified must be native species, per the provided species list.
    - a. A minimum of five (5) percent must be Regionally or Locally Native.
  2. From January 2, 2020 to January 1, 2024, a minimum of thirty (30) percent of all evergreen shrubs specified must be native species, per the provided species list.
  3. From January 2, 2024, a minimum of forty (40) percent of all evergreen shrubs specified must be native species, per the provided species list.
    - a. A minimum of ten (10) percent must be Regionally or Locally Native.
  4. Non-native shrubs for purposes of providing edible fruits, seeds, or nuts may be planted and would not be calculated in the above-stated requirements for native species.
    - a. A minimum of eight (8) percent must be Regionally or Locally Native.
- ii. Deciduous shrubs
1. From adoption of the updated Landscape Guidelines to January 1, 2020, a minimum of forty (40) percent of all deciduous shrubs specified must be native species, per the provided species list.
    - a. A minimum of ten (10) percent must be Regionally or Locally Native.
  2. From January 2, 2020 to January 1, 2024, a minimum of sixty (60) percent of all deciduous shrubs specified must be native species, per the provided species list.
    - a. A minimum of fifteen (15) percent must be Regionally or Locally Native.
  3. From January 2, 2024, a minimum of eighty (80) percent of all deciduous shrubs specified must be native species, per the provided species list.
    - a. A minimum of twenty (20) percent must be Regionally or Locally Native.
  4. Non-native shrubs for purposes of providing edible fruits, seeds, or nuts may be planted and would not be calculated in the above-stated requirements for native species.



- e. Groundcovers: While the use of native species for groundcovers is highly encouraged due to its potential benefits of ecosystem services and enhancement of biodiversity, the City recognizes that the availability of native groundcover plants from the nursery industry is very limited. Further, groundcovers are often used in very challenging areas where exposure to salt, dog waste, and other pollution further limits the number of native groundcovers that could tolerate such situations. Therefore, the lower percentage requirements of native groundcovers reflect these challenges.
  - i. For the purposes of the Landscape Guidelines, groundcovers are distinguished from perennials in that groundcovers are low-growing (under eighteen (18) inches height), clonally reproducing plants (via rhizomes, runners, etc.) whose use is intended to form a continuous bed or mat of plant materials.
  - ii. From adoption of the updated Landscape Guidelines to January 1, 2020, a minimum of ten (10) percent of all groundcovers specified must be native species, per the provided species list.
    - a. A minimum of five (5) percent must be Regionally or Locally Native.
  - iii. From January 2, 2020, a minimum of twenty (20) percent of all groundcovers specified must be native species, per the provided species list.
    - a. A minimum of ten (10) percent must be Regionally or Locally Native.



f. Perennials, Ferns, and Ornamental Grasses:

- i. From adoption of the updated Landscape Guidelines to January 1, 2020, a minimum of twenty-five (25) percent of all perennials, ferns and ornamental grasses specified must be native species, per the provided species list.
  - a. A minimum of ten (10) percent must be Regionally or Locally Native.
- ii. From January 2, 2020 to January 1, 2024, a minimum of forty (40) percent of all perennials, ferns, and ornamental grasses specified must be native species, per the provided species list.
  - a. A minimum of fifteen (15) percent must be Regionally or Locally Native.
- iii. From January 2, 2024, a minimum of sixty (60) percent of all perennials and eighty (80) percent of all ferns and ornamental grasses specified must be native species, per the provided species list.
  - a. A minimum of twenty-five (25) percent for perennials and thirty (30) percent for ferns and ornamental grasses must be Regionally or Locally Native.



g. Vines: As vines represent an outsized proportion of particularly aggressive invasive exotic plants, the percentage of native species listed in the table for vine plantings is specified.

- i. From adoption of the updated Landscape Guidelines to January 1, 2020, a minimum of eighty (80) percent of all vines specified must be native species, per the provided species list, with the following exceptions.
  1. Non-native vines for purposes of providing edible fruits (ex. grapes, kiwi) may be planted and would not be calculated in the above-stated requirements for native species.
- ii. From January 2, 2020, one hundred (100) percent of vines specified must be native species, per the provided species list, with the following exceptions.
  1. Non-native vines for purposes of providing edible fruits (ex. grapes, kiwi) may be planted and would not be calculated in the above-stated requirements for native species.

### 3. Invasive Species

- a. No plants recognized as invasive species shall be installed. Chapter 6. provides the most up-to-date listings of invasive species or those of concern or study.

- i. Final Site Plan: If a planting plan utilizes a plant species that has been listed as invasive since the time of the plan's approval, a substitution of the invasive plant is required.
- ii. Construction Inspection: Any invasive species must be removed and replaced with an acceptable alternative. An invasive species may not be planted as a substitution to an approved plant.



# 4

## Standards for Development Site Plans

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# Planting Area Standards

## OVERVIEW

The layout and design of planting areas for trees and other vegetation have a lasting impact on the safety of the public and the longevity and function of the plantings. The goal is to minimize conflict between plantings and user requirements or City infrastructure and to maximize the environmental benefits of these planting areas through long-term plant survival. The standards presented below provide a minimum assurance that planting areas are designed to account for the most common urban challenges.

## STREET TREES

1. **Street Trees (general): Street trees include all existing and proposed trees within the public right-of-way (ROW) adjacent to a street or roadway.**
  - a. Projects that require a Development Site Plan or Development Special Use Permit approval require street trees to be planted per the following standards:
    - i. One street tree is required for every thirty (30) feet of lot frontage along the public right of way, with a minimum of one (1) per frontage. Street trees shall be spaced a minimum of every twenty-five (25) linear feet and a maximum of every thirty (30) linear feet (specified on-center, O.C.) to accommodate existing and proposed infrastructure such as bus stops, underground utilities and curb cuts.
      1. Where this requirement cannot be met, a fee in lieu of \$2,500 per tree deficient of meeting the required number of street trees shall be provided to the City's Department of Recreation, Parks and Cultural Activities Urban Forestry Fund.
    - ii. Minimum distance from a streetlight or utility pole to the tree trunk is twelve (12) feet.
    - iii. Shade and ornamental street trees shall be single leader (unless approved by the City).
    - iv. Neither evergreen trees nor trees with large, soft fruits (ex. edible fruits such as apples).
    - v. In areas where overhead utilities are present and/or conflict with street trees, ornamental or other Category I or II trees (less than twenty (20) foot mature height) shall be specified.
    - vi. Refer to Chapter 5 Maintenance for pruning and limbing standards for street trees.
  - b. Additional design or spacing requirements may be determined by the City depending on the location and site conditions.
2. **Standard (non-BMP) Street Tree Wells:**
  - a. Exposed surface area of tree wells shall be a minimum of five (5) by ten (10) feet.
    - i. Larger dimensions shall be required if deemed appropriate by the City or required as a part of the development review process or relevant Small Area Plan.
  - b. Tree well trenches/soil panels shall be continuous between tree wells beneath the surface of the sidewalk.
    - i. All sidewalks and driveways constructed above tree well trenches/soil panels shall be structurally supported. Areas of uncompacted growing medium shall not be used to support sidewalks and driveways without additional structural support. Refer to City Standard Details.

- c. Dependent upon project conditions and at determination of the City, tree wells shall be:
  - i. Planted with a hardy, non-invasive ground cover suitable for the site location and anticipated traffic/impacts;
  - ii. Planted with grass sod; or
  - iii. Covered with granite block per details provided in Chapter 6. References and Appendices.

### 3. Continuous Planting Strips (non-BMP):

- a. Street trees in planting strips shall be installed in compliance with City Standard Details (see Chapter 6. References and Appendices). For all new development, planting strips located between adjacent pavement and back of curb shall be a minimum of five (5) feet in continuous width.

### 4. BMP Tree Wells: Refer to the City's [Green Sidewalks BMP Design Guidelines](#).



## LANDSCAPE ISLANDS IN PARKING AREAS

1. Surface and above-grade parking areas without enclosures or overhead structures shall be designed to accommodate landscape islands for installation of plantings.
  - a. Landscape islands in the interior of parking areas shall include a minimum of one (1) Category III or IV tree, except where the location of the tree may conflict with pedestrian circulation, emergency vehicle access, light poles, signs, and site utilities, and shall be:
    - i. Planted with a hardy, non-invasive evergreen ground cover suitable for the site location and anticipated traffic/impacts;
    - ii. Planted with grass sod;
    - iii. Covered with granite block per details provided in Chapter 6. References and Appendices; or
    - iv. Utilized as an approved stormwater BMP.
  - b. Due to heat and drought stress and vision clearances, ornamental and evergreen trees are not permitted.
  - c. Quantity: Landscape islands in parking areas shall be provided at a ratio of one (1) per ten (10) parking spaces and approximately every one-hundred (100) linear feet of parking row.
  - d. Location: Landscape islands shall be incorporated into the ends of all parking rows, sides of ingress/egress aisles and pedestrian access ways.

- e. Dimensions: Landscape islands shall be, at a minimum, the dimension of immediately adjacent parking spaces.

## **PARKING BUFFERS AND SCREENING**

1. Continuous and uninterrupted planting is required for parking areas adjacent to, or visible from the public right-of-way.
2. Locate set back two and one-half (2.5) feet from back of nearest curb to prevent damage by vehicle parking. If wheel stops are used, setback may not be required.



# Soils

## GOALS AND INTENT

Soil quality and volume are critical factors in plant health and longevity. In urban environments, existing soils on development sites tend to be previously disturbed and of relatively poor quality for plant survival and growth. In the City of Alexandria, heavy clay soils are frequently a problem due to their tendency to compact and their low porosity.



Many factors contribute to soil quality, including nutrients, percentage of organic material, level of acidity (pH), and physical compaction. It is not always possible or necessarily advantageous to amend soils or replace all existing soil with new soil mixes. Certain minimum requirements will help enable trees and vegetation to establish and thrive.

In addition, there are specific soil requirements for planting on-structure and for bioretention applications that must be met to ensure that soils perform appropriately in these special conditions.

## SOIL COMPOSITION

### 1. Planting Soil Composition At-grade:

- a. Planting soils for all at-grade applications shall be a combination of existing soil, organic amendments, and additives as necessary to meet the following standards:
  - i. A pH range appropriate to the plant species proposed, based on a site soil sample<sup>1</sup>.
  - ii. Bulk Density maximum 1.4 grams/cubic centimeter (g/cc) for topsoil and 1.6 g/cc for subsoil.
    1. The minimum soil sample depth required for bulk density testing is twelve (12) inches.
    2. Testing is to be performed no more than four (4) weeks prior to plant installation.
    3. For the purposes of bulk density, topsoil is considered to extend to a depth of 14 inches.
  - iii. Organic matter shall constitute a minimum of five (5) percent of soil volume.

### 2. Planting Soil Composition On-structure:

- a. Where on-structure planting applications are intended to fulfill stormwater management functions, soil standards shall meet the standards and specifications as published in the most recent version of the Virginia Stormwater BMP Clearinghouse.
- b. Where on-structure planting applications are not intended to fulfill stormwater management functions, soil standards shall meet either the above-stated standard in 2.a. or a lightweight growing media developed according to ASTM Standard E2777, 2014, "Standard Guide for Vegetative (Green) Roof Systems."

### 3. Bioretention Soils: Bioretention soils are specialized soil mixes intended to provide appropriate performance for removal of pollutants as stormwater filters through.

- a. Soils to be used in stormwater BMP bioretention applications shall meet the standards and specifications as published in the most recent version of the Virginia Stormwater BMP Clearinghouse.

<sup>1</sup> Refer to Chapter 5. Completeness and Preliminary Landscape Plan Submission Requirements.

- b. When surface stormwater BMPs are installed, soil infiltration rates and the location of the seasonal high ground water table may be required per the Virginia Stormwater BMP Clearinghouse design specifications.

## SOIL VOLUME AND DEPTH

### 1. At-grade Applications:

- a. Where a tree trench is continuous and shared by two (2) or more trees, a minimum of three hundred (300) cubic feet per tree shall be provided, calculated with a maximum three (3) foot depth.
  - i. Continuous tree trenches and covered soil volumes that provide for a system of expanded and shared soil are required for street trees. This requirement may be waived by the City where it is determined that continuous wells are infeasible based upon plans that demonstrate this justification provided by the applicant.
- b. For each individual, isolated tree planted, a minimum volume of four-hundred fifty (450) cubic feet per tree shall be provided, calculated with a maximum three (3) foot depth.

### 2. On-structure Applications:

- a. Plantings above structure subject to the soil volume requirements include all trees, shrubs, perennials, ornamental grasses, turfgrass, and groundcover planted on rooftops, and plazas and courtyards located above decks and parking garages.
- b. Soil Volume for Trees:
  - i. Where a planter or tree box is continuous and shared by two or more trees, a minimum of three hundred (300) cubic feet per tree shall be provided, calculated with a maximum three (3) foot depth.
  - ii. For each isolated tree planted, a minimum volume of four-hundred fifty (450) cubic feet per tree shall be provided, calculated with a maximum three (3) foot depth.
- c. Minimum Soil Depth Requirements: Vertical soil depth is the measurement between finished grade of planting media and bottom of the planting media. This measurement shall not include gravel utilized as a drainage layer at beneath the planting media.
  - i. Trees: Three (3) feet minimum continuous vertical soil depth of planting media for a minimum horizontal distance of three (3) feet measured from the center of the root ball.
  - ii. Shrubs, Perennials and Ornamental Grasses: Two (2) feet minimum of continuous vertical depth of planting media.
  - iii. Turf and groundcover Areas: One (1) foot minimum of continuous vertical depth of planting media.

### 3. Alternative Methods for Soil Volume: Alternative methods for increasing available soil volume below street, sidewalk, and plaza structures may be acceptable, subject to review as part of the Final Site Plan process and in accordance with the following standards:

- a. Such methods may include, but are not limited to, modular suspended pavement systems and structural soils, and will be considered by the City on a case-by-case basis.
- b. Tree trenches that provide access to adjacent uncompacted soil that provides arable soil volume, adequate moisture, and space for rooting of individual trees may account for up to twenty (20) percent of the total required soil volume.
- c. Calculations shall be provided for any alternative method indicating effective soil volume provided per tree, where volume dedicated to structural components vs. soil available to the root structure are delineated.

# Irrigation

## OVERVIEW

All site vegetation requires a watering regimen when installed to establish healthy root systems. Individual plant selections and site conditions will dictate the most appropriate requirements for each site. Once a landscape has matured, even the most well-adapted plants for a given climate may require additional watering during periods of extreme drought.

Irrigation standards for establishment and maintenance help to minimize replacement of vegetation. When trees and other vegetation die and require replacement, not only are there monetary costs, but valuable time has been lost toward the development of a mature and beneficial landscape for the City.

## IRRIGATION STANDARDS

### 1. Establishment Period

**The irrigation establishment period for new vegetation shall begin at the time of planting until the release of the Maintenance Bond according to the following standards:**

- a. Trees shall be watered at a minimum rate of twenty (20) to twenty-five (25) gallons, or 1.5 inches, per week during the period of March 1 – December 1 for the establishment period, including rainfall and weather dependent.
- b. Shrubs, herbaceous plants, groundcover and other vegetation shall be watered at a minimum of one (1) inch per week during the period of March 1 – December 1, or when temperatures are sustained above forty (40) degrees Fahrenheit, for the establishment period, including rainfall.
- c. Turfgrass/lawn areas, including areas where “turf-block” or “turf-rings” are installed, require intensive water management and monitoring during installation and establishment. Continue to water at a rate of one (1) inch per week, including rainfall, especially in summer months.
  - i. Lawn areas shall be irrigated in accordance with the standards as specified in the latest version of the [Landscape Specification Guidelines: Part 6 – Seeding and Sodding](#), as published by the Landscape Contractors Association of MD, DC, and VA.

### 2. Irrigation Methods

Provide a proposed water management plan for approval with the first Final Site Plan. The water management plan shall identify the watering method and schedule for all planting areas, including turfgrass, located at-grade and on-structure. The following methods shall be permitted:

- a. Hand (manual) watering.
  - i. When using hoses for hand watering, hoses may not be left un-stored when watering is not taking place.
  - ii. Water sources may include tanks, trucks, exterior building faucets, or rain harvesting barrels/cisterns.
  - iii. Manual systems shall have hose bibs or ground set hose connections 90 feet on-center along building perimeters.
- b. Irrigation Bags/Rings for trees.



c. Automated irrigation such as drip and spray systems:

- i. Irrigation system designs shall be prepared and sealed by a certified irrigation specialist.
- ii. All irrigation tubing should be set below the mulch layer.
- iii. Automatic sprinklers shall be cleaned out and winterized in the fall prior to the first frost, and tested when turned on in the spring.
- iv. Where the site irrigation system is to be integrated with the City of Alexandria's Maxicom system, compliance with City standards and specifications for equipment and design are required.
- v. Automatic irrigation systems within the public right of way will be reviewed upon an individual basis.

1. Irrigation systems within the public ROW shall require a maintenance agreement with the City to the satisfaction of the Directors of T&ES, RPCA, and P&Z.

d. Rainwater reuse or graywater systems are encouraged for irrigation of planting areas and shall be reviewed on an individual basis.

3. Upon declaration of a water shortage condition or water supply emergency by the City, voluntary restrictions, water conservation practices, and/or water consumption restrictions or prohibitions shall be followed pursuant to the [City Code of Ordinances](#).

# Planting Seasons

## OVERVIEW

A number of factors must be considered when installing plant material to ensure the best possible chance of successful establishment. One of these factors is planting seasons. To ensure that plants are afforded the best chance of establishment and thriving, planting timeframes or seasons are established per regional historical climatic data such as rainfall patterns and temperature cycles, and typical plant performance. The planting seasons described herein provide windows of time for best plant establishment.

## PLANTING INSTALLATION SEASONS

Planting seasons below are general timeframes which vary dependent on project-specific environmental conditions and annual weather patterns. Due to construction schedules, recommended planting seasons may/may not coincide with request(s) for Certificate of Occupancy for projects. Coordination of planting installation and seasons for such cases shall be reviewed on an individual project basis.

### 1. Select Tree Species

- a. Certain plant species are affected more than others by seasonal planting factors. The following trees may only be planted during the spring planting season (March 1 - June 15)
  - i. Oaks (*Quercus Sp.*, such as *Q. rubra*, *Q. alba*, *Q. phellos*, *Q. coccinea*).
  - ii. Dogwood (*Cornus Sp.*)
  - iii. Sweetgum (*Liquidambar Sp.*)
  - iv. All Conifers and Evergreens.

### 2. Deciduous Trees and Shrubs

- a. Install/plant between March 1 and June 15 and/or September 15 and November 15.

### 3. Coniferous & Evergreen Trees and Shrubs

- a. Install/plant between March 1 and June 15.

### 4. Perennials, Groundcovers & Ornamental Grasses

- a. Install/plant between March 1 and June 15 and/or September 15 and November 15.

### 5. Spring Flowering Bulbs

- a. Install/plant between September 15 and December 15.

### 6. Fall Flowering Bulbs

- a. Install/plant between March 1 and June 15.

### 7. Seasonal Annuals

- a. Install/plant in season per approved schedule.

### 8. Turfgrass

- a. Install/plant between March 1 and May 15 and/or September 15 and October 15.

- b. Do not install/plant seed or sod turfgrass areas when ambient air temperature is below forty (40) degrees Fahrenheit, or is forecast for a twelve (12) hour period after completion of work.

**9. No Plant Installation**

- a. Do not install plantings or turfgrasses between June 15 and September 15, or November 15 and March 1, without prior written approval by the City. Exceptions will be evaluated based on the following criteria:
  - i. Type of plants to be installed outside of the planting installation seasons
  - ii. Proposed maintenance plan, including extra measures to ensure the health of the plantings.

The planting season installation periods described above are summarized in the following table:

**PLANTING SEASON INSTALLATION SCHEDULE**

| PLANT TYPE                                      | SPRING PLANTING INSTALLATION<br>(MARCH 1 - JUNE 15)                                 | FALL PLANTING INSTALLATION<br>(SEPTEMBER 15 - NOVEMBER 15)                             | NO PLANTING INSTALLATION<br>(JUNE 15-SEPTEMBER 15 & NOVEMBER 15-MARCH 1)              | OTHER APPROVALS                               |
|---|---|--|---|---|
| Deciduous Trees and Shrubs                      |   |  *   |   |   |
| Coniferous & Evergreen Trees and Shrubs         |  |  |  |   |
| Perennials, Groundcovers and Ornamental Grasses |  |     |  |   |
| Spring Flowering Bulbs                          |   |  ** |  |   |
| Fall Flowering Bulbs                            |  |  |  |   |
| Seasonal Annuals                                |   |  |   | Per season in approved plant schedule         |
| Turfgrass                                       |   |  |   | March 1-May 15 and/or September 15-October 15 |

\*Except Quercus Sp., Cornus Sp., and Liquidambar Sp. for optimal establishment.

\*\*September 15-December 15



# 5

## Development Review Process

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## Landscape in the Development Review Process

All major development projects in the City of Alexandria go through a rigorous review process. The most common development applications submitted to the City are a Development Site Plan (DSP) and a Development Special Use Permit (DSUP). A summary of the overall DSP/DSUP review process is provided in the [Department of Planning and Zoning's Development Review Process Brochure](#). Both DSP and DSUP projects shall adhere to the Landscape Guidelines. The following sections outline how the Landscape Guidelines are applied in the preparation and review of plans for each of the development stages and how this document interacts with the respective checklists for each stage.



# Critical Design Considerations

## OVERVIEW

The Landscape Guidelines provide a framework for design, rather than dictate the design itself. A successful landscape design will optimize both environmental and social benefits, providing spaces that are ecologically responsible, engaging to residents, and aesthetically pleasing. The following considerations should be made in preparing and reviewing the Completeness Plan and Preliminary Plan, as this is a significant point in the process where critical design decisions are made.

### 1. Existing Conditions:

- a. Topography – Evaluation of the existing topography is necessary to determine the layout of the proposed site features. At a minimum, the designer should consider the following information to maximize the opportunities of these features and avoid common errors such as creating excessive cut and fill on a site:
  - i. Steep slopes
  - ii. Areas with poor drainage
  - iii. Accessibility to and throughout the proposed development
- b. Vegetation – Whenever possible, trees in fair, good or excellent condition as identified in the Tree and Vegetation Survey and shrubs greater than three (3) feet in height should be preserved.
- c. Soils – Soil quality has a major impact on construction of site features and planting areas. A site's existing soil typology and quality should be known prior to specification of significant features such as retaining walls and specification of planting areas and plant material.

### 2. Context:

- a. Urban environments are not suitable for plant material that cannot withstand soil compaction, salt exposure, and other stresses commonly found in built environments.
- b. Significant views should be framed, rather than obstructed by vegetation.
- c. Use of vegetation should be considered where wind protection or privacy is desired.

3. **Crime Prevention Through Environmental Design: Crime Prevention Through Environmental Design (CPTED) is a set of design strategies for urban environments that are intended to deter potential criminal offenders from committing a crime. The landscape design shall incorporate the strategies related to territoriality, surveillance, access control and maintenance. The design strategies should align with the recommendations of the International CPTED Association.**
4. **Sun Exposure: Sun exposure is a significant factor in the survivability of plant material and also the comfort of users within a space. Building orientation and shadows should be considered when specifying planting areas and plant material. For example, plants which require part-sun to full-sun exposure should not be planted on north side of a building.**
5. **Microclimates: A microclimate is the climate of a small or restricted area that differs from the climate of the surrounding area. Microclimates often exist under the canopies of trees, near bodies of water, adjacent to buildings and masonry walls, or where paving materials absorb the sun's energy. Microclimate factors should be considered when specifying plant species and designing the layout and arrangement of planting areas to ensure survivability of the plants**

6. **Maintenance:** Landscape maintenance is critical to the survivability and success of any landscape. Chapter 5. Maintenance outlines the requirements for maintenance, which includes activities such as watering, weeding, trash removal, and pruning. The intended level of maintenance must be considered when designing a space and specifying plant material without compromising quality.
7. **Historic and Cultural Landscapes:** Alexandria has a rich and complex history spanning centuries that is often best understood through its historic settings, archaeological remains and cultural landscapes. As explained by the National Park Service (NPS), “cultural landscapes are composed of a collection of features which are organized in space. They include small-scale features such as individual fountains or statuary, as well as patterns of fields and forest which define the spatial character of the landscape.” This guideline is intended to identify and contextualize a cultural landscape at the beginning of the design process in order to preserve and protect significant cultural landscapes and their character-defining features. For more information about cultural landscapes please see NPS Preservation Brief 36 - <https://www.nps.gov/tps/how-to-preserve/briefs/36-cultural-landscapes.htm>.
  - a. Requirements
    - i. Any DSP or DSUP that might alter or threaten a cultural landscape, identified in consultation with the City’s Office of Historic Alexandria (Archaeology) and Department of Planning & Zoning (BAR/Historic Preservation) staff, must prepare a cultural landscape report and consider a project’s effects on the cultural landscape. A cultural landscape report must be prepared by someone with professional cultural resources expertise. The report should be generally consistent with the US Department of the Interior’s Guidelines for the Treatment of Cultural Landscapes and include, at a minimum, the following:
      1. Write a context statement for the cultural landscape.
      2. Survey and identify character-defining features (e.g., topography, vegetation, circulation patterns, water features, viewshed and historic structures and resources) and the interrelationships of the features.
      3. Analyze and evaluate findings and address the impact of the proposed project on the extant character-defining features and landscape as a whole.
      4. Propose efforts to preserve and protect significant character-defining features of the cultural landscape as part of the overall site design.

# Concept Plan

## OVERVIEW

The Concept Plan review is an informal process designed to identify major issues before investment in detailed engineering and is divided into two review stages: Concept 1 Plan and Concept 2 Plan. The Landscape Guidelines shall be adhered to in preparation of the Concept Plans to incorporate the following standards. In the event that conflicts between the Landscape Guidelines and the [Development Concept Plan Checklist](#) occur, the Landscape Guidelines shall apply.

## Concept Plan 1 Landscape Plan Submission Requirements

1. In coordination with the [Concept 1 Plan Checklist](#), landscape-related items that must be identified in the Concept 1 Plan include:
  - a. Delineation of all floodplains, RPAs, intermittent streams, wetlands, associated buffers, and existing stormwater facilities, including vegetated BMPs
  - b. Information on soils (including marine clay soils), environmental issues, and contamination known to applicant
  - c. Existing easements, major public utility lines, and any other encumbrances
  - d. Areas of proposed open space
  - e. Significant proposed site features (such as retaining walls, steep slopes, etc.)
  - f. Existing cultural/historic resources

## Concept Plan 2 Landscape Plan Submission Requirements

1. The Concept 1 Plan information is carried over to the Concept 2 Plan with more detailed information of existing conditions, stormwater management, open space, proposed architecture and features. In coordination with the [Concept 2 Plan Checklist](#), landscape-related items that must be identified in the Concept 2 Plan include:
  - a. Existing Conditions:
    - i. Existing tree survey, prepared in accordance with Chapter 3. Tree and Vegetation Survey.
    - ii. Topographical survey
      1. Existing contours at two (2) foot intervals on the subject property and on adjacent parcels for sufficient distance to indicate the relationship of the site to off-site terrain.
      2. Finished floor elevation of existing building(s), if applicable.
    - iii. All existing above and below grade utilities and associated easements.

## iv. Soil Survey:

3. A statement describing any known or expected contamination or brief narrative of due diligence completed (site history) if none is expected.
4. Areas of existing environmental issues such as contaminated soils or groundwater identified, as applicable.
5. A statement whether or not the site has areas of Marine Clay with areas identified, as applicable.

## b. Proposed Landscape Plan:

- i. Property line and limits of disturbance (LOD), including all utility work.
- ii. Location of all buildings and structures, curb cuts and driveways.
- iii. All existing and proposed above and below grade utilities and associated easements.
- iv. Significant proposed site features such as retaining walls, steep slopes, etc.
- v. Identification of existing trees to be preserved and/or removed based upon the Tree and Vegetation Survey.
- vi. Planting schedule with the size, species, location and quantity of proposed trees on-site and within the public right of way.
- vii. Preliminary Crown Cover Allowance (CCA) tabulations to include area of existing crown cover to be removed and crown cover accounted for through preserved and proposed trees (does not include street trees).
- viii. Graphic depiction of proposed open space (ground level and rooftop), with types of landscaped areas (i.e., intensive green roof, extensive green roof, bioretention, planting bed, tree well, etc.) identified.

# Completeness and Preliminary Plan

## OVERVIEW

The Completeness and Preliminary Plan stage is the point in the development review process where the DSP/ DSP applications are reviewed by all City departments to ensure that the plans are “complete” and therefore contain all of the necessary information outlined on the appropriate checklists and demonstrate consistency with the applicable Small Area Plan. Once the plans are deemed “complete” City staff will begin drafting a staff report and preparing conditions of approval for review and approval by the Planning Commission and/or City Council . Once approved, the Preliminary Plan becomes the basis for advancement of the plans in the Final Site Plan stage and ultimately building permit and construction. It is this point in the process where the landscape design is complete and the landscape plans provide sufficient detail that communicates both the design intent and the plant specification.



# Completeness and Preliminary Landscape Plan Submission Requirements

## OVERVIEW

Once the Concept Plan items are addressed, the DSP/DSUP application is reviewed by all City departments to ensure it is complete. This process typically includes a “Completeness Plan” submission and a subsequent “Preliminary Plan” submission in preparation for public hearing by City Council and/or the Planning Commission. The information required in the Landscape Guidelines for the Concept Plan stage is carried forward to the Completeness Plan and Preliminary Plan stages, in addition to the following standards. Where conflicts between the Landscape Guidelines and the [Development Preliminary Site Plan Checklist](#) occur, the Landscape Guidelines shall apply.

## SUBMISSION REQUIREMENTS

1. In addition to the information provided in the Concept 2 Plan submission, and in coordination with the Development Preliminary Site Plan Checklist, landscape-related items that must be identified in both the Completeness Plan and Preliminary Plan include:
  - a. Existing Conditions:
    - i. Topographical survey
      1. Spot elevations of high and low points
      2. Spot elevations at existing drains
      3. Slopes, terraces and retaining walls, including elevations of the tops and bottoms of walls and exterior stairs and ramps
    - ii. Soil Survey
      1. A soil sample test report that documents the existing soil pH
  - b. Tree and Vegetation Protection Plan prepared in accordance with the standards outlined in Chapter 3.
  - c. Proposed Landscape Plan:
    - i. Locations of underground parking and the footprint of subsurface structures
    - ii. Locations and dimensions of areas to be landscaped including proposed individual trees, shrubs, and ground cover plants
      1. Stormwater planting plans will require additional review at the Final Site Plan stage once stormwater calculations are complete.
    - iii. Diagram of areas to be irrigated and intended method of irrigation (hand-watering, automatic drip, spray, etc.)
    - iv. Indicate distances between street trees
    - v. Crown Cover Allowance (CCA) tabulations
    - vi. Plant Diversity and Natives Percentages tabulations

- vii. Plans shall be sealed by a Professional/Registered Landscape Architect licensed to practice in the Commonwealth of Virginia.
- d. Cultural landscape analysis as outlined in Chapter 5. Critical Design Considerations.



# Final Site Plan

## OVERVIEW

The intent of the Final Site Plan is to advance the Preliminary Plan approved by City Council with more detail suitable for further development into a set of construction drawings. Once approved, the Final Site Plan is used as the benchmark for reviewing building permits and as-built surveys. Ultimately, the approved Final Site Plan serves as the presiding document for the actual improvements, including all landscape items, to be constructed, installed, and maintained.





# Final Site Plan Landscape Plan Submission Requirements

## OVERVIEW

The next step in the plan review process after the DSP/DSUP Preliminary Plan is approved by City Council and/or the Planning Commission is the Final Site Plan stage. The Final Site Plan is an engineered set of drawings that require approval by City staff prior to application for building permits can occur. Where conflicts between the Landscape Guidelines and the [Final Site Plan Checklist](#) occur, the Landscape Guidelines shall apply.

## SUBMISSION REQUIREMENTS

1. **The information in the Final Site Plan builds upon the Preliminary Plan with a much higher level of detail. In coordination with the [Final Site Plan Checklist](#), landscape-related items that must be identified in the Final Site Plan include:**
  - a. Existing Conditions: Include the same information as required in the Preliminary Plan, with corrections as required by approval.
  - b. Tree and Vegetation Protection Plan: Include the same information as required in the Preliminary Plan, with corrections as required by approval and additional details listed in Section 1d of this chapter, as applicable.
  - c. Proposed Landscape Plan: Include the same information as required in the Preliminary Plan with corrections as required by approval, in addition to:
    - i. A detailed grading plan that verifies positive drainage in all planted areas and top of wall and bottom of wall elevations when raised planters are used.
    - ii. Identification of the extents of soil areas for tree wells/trenches beneath walking surfaces.
    - iii. A plan exhibit that verifies the volume of growing medium in street tree wells/trenches and all plantings above structure, as applicable. The plan shall identify all areas that are considered to qualify towards the soil volume requirements, with numerical values illustrating the volumes.
    - iv. A water management plan prepared in accordance with the Irrigation chapter of this document.
    - v. Percolation test reports shall be required for planting on public land to ensure sufficient subgrade drainage.
    - vi. Infiltration rates for BMPs and location of the seasonal high ground water table, as needed.
  - d. City Standard Landscape Details (refer to Chapter 6. for the City's Standard details), as applicable:
    - i. Tree Preservation and Protection:
      1. Tree Protection Fencing
      2. Determining Critical Root Zone
      3. Root Pruning
      4. Tree Protection Barriers for Street Trees

- ii. Proposed Planting:
  - 1. Trees
    - a. Tree Planting (deciduous, multi-stem & evergreen)
    - a. Tree Planting on Slope
    - a. Street Tree Planting in Tree Well
    - a. Street Tree Planting in Planting Strip
    - a. Deciduous Tree Staking and/or Guying
    - a. Evergreen Tree Staking
  - 2. Shrubs
    - a. Shrub Planting
    - a. Shrub Planting on Slope
  - 3. Ground Covers and Perennial Planting
  - 4. Continuous Soil Panel
  - 5. BMP Tree Wells– Refer to the [City's Green Sidewalks BMP Design Guidelines](#)
  - 6. Surface BMPs – Refer to the most recent specifications published in the Virginia Stormwater BMP Clearinghouse
- e. On-structure Planting Details, as applicable:
  - i. Tree Planting (deciduous, multi-stem & evergreen)
  - ii. Shrub Planting
  - iii. Ground Covers and Perennial Planting
  - iv. Deciduous Tree Staking and/or Guying
  - v. Evergreen Tree Staking
  - vi. Bioretention Planter
  - vii. Extensive Vegetated Roof

# Pre-Construction and Installation

## OVERVIEW

Once the Final Site Plan is approved, the next step in the development process is application and issuance of building permit. Specific coordination procedures must be completed prior to commencement of demolition, construction, or any land disturbance to ensure the health of vegetation to be preserved. Additional coordination efforts are then taken prior to installation to ensure the success of vegetation to be planted. Together, these measures ensure minimal impact to the existing vegetation and provide optimal conditions for all vegetation to thrive following completion of the construction.

## PRE-CONSTRUCTION AND INSTALLATION PROCEDURES

1. **The approved method(s) of protection must be in place for all vegetation to be preserved on-site and adjacent to the project site pursuant to the approved Tree and Vegetation Protection Plan and details prior to commencement of demolition, construction, or any land disturbance.**
  - a. The applicant shall notify the Planning and Zoning (P&Z) project manager once the tree protection methods are in place.
    - i. The P&Z project manager will notify the City Arborist at this time for projects with or adjacent to trees to be saved within the public ROW or on public land.
    - ii. The P&Z project manager will schedule a site inspection to ensure the tree protection is installed pursuant to the approved Tree and Vegetation Protection Plan. The project arborist must meet the P&Z project manager on-site for the duration of the inspection for planting on public lands noted above.
  - b. Within three (3) business days following the inspection, the P&Z project manager will provide written confirmation to the applicant verifying that tree protection methods are installed per the approved Tree and Vegetation Protection Plan, or issue written comments with items in need of correction if tree protection measures are not installed per the approved plan.
    - i. If items are identified to be corrected, the applicant must notify the P&Z project manager once the corrections are made and a subsequent inspection will be scheduled.
  - c. Any changes, alterations or modifications to the site conditions that affect protection zones will require an amendment to the Tree and Vegetation Protection Plan and/or details.
2. **The applicant must contact the P&Z project manager prior to commencement of landscape installation/ planting operation to schedule a pre-installation meeting. The meeting should be held between the applicant's general contractor, landscape contractor, landscape architect, the P&Z project manager and the City Arborist (as applicable) to review the scope of installation procedures and processes during and after installation.**
  - a. The P&Z project manager should ensure that the following information is discussed with the applicant at the meeting:
    - i. The approved Final Site Plan, which includes landscape plans, plant schedules, notes and details shall be the document used for installation purposes and all procedures set forth in the Landscape Guidelines must be followed.

1. The applicant is responsible for resolving any conflicts between the approved Final Site Plan and the construction documents. Any substitution in plant material must follow the plant substitution procedure outlined in the Specification of Plant Species and Maintenance sections of these Guidelines.
    - ii. The landscape contractor shall be responsible for understanding all applicable conditions of approval. All questions regarding conditions should be directed to the P&Z project manager.
    - iii. The contractor shall not interfere with any tree protection measures or impact any existing vegetation identified to be preserved per the approved plans.
  - b. The following information shall be provided to the P&Z project manager at least five (5) business days prior to the landscape pre-installation meeting:
    - i. A letter that certifies that the project landscape architect performed pre-selection tagging for all trees proposed within the public right-of-way and on public land prior to installation. This letter must be signed and sealed by the project landscape architect.
    - ii. A copy of the soil bulk density test report verifying that maximum compression rates are met.
  - c. Installation of plant material may only occur during the timeframes identified in Chapter 4. Planting Seasons
- 3. Should drainage issues or other visible signs of failure arise following installation and prior to release of the Maintenance Bond, the applicant shall be responsible for conducting a full-depth soil core analysis and testing to verify proper installation.**
- a. In the event that the analysis verifies improper installation of the tree well, trench, or strip the applicant shall be responsible for conducting corrective measures prior to release of the Maintenance Bond.

# Construction

## OVERVIEW

Construction may begin once the Final Site Plan and all required building permits are approved and issued. Close coordination between the applicant, contractor(s), and the City is required before, during, and following site work and construction to ensure the health of trees to be saved and proper conditions exist for vegetation to be planted. The result of this coordination is to provide zero or minimal impacts to existing vegetation to be saved and optimal conditions for new vegetation to thrive. Ultimately, each landscape will mature and contribute to the success of the City's economic, social, and environmental goals.



## Project Close Out and Maintenance

The Project Close Out stage transitions a project from construction to occupancy and maintenance. The Project Close Out stage establishes a communication plan between the applicant and the City for the minimum requirements for occupancy and bond release based on each individual site plan. Close-out requirements that apply to all projects include standards for plant establishment and landscape maintenance.



# As-Built Documents and Inspections

## OVERVIEW

The intent of the as-built survey plans and inspections is to ensure that the built improvements are consistent with the approved Final Site Plan. The initial post-construction inspection begins with the request for the first Certificate of Occupancy (CO) which requires submission of professionally certified as-built survey drawings. Following issuance of the final CO, subsequent as-built survey drawings and inspections are required for bond release. For the landscape, the purpose of these subsequent surveys and inspections is to verify proper maintenance of the plant material during the establishment period, which is critical to its success.

For additional information on the as-built and bond process, refer to the Department of Transportation and Environmental Services, Site Plan Division.

## CERTIFICATE OF OCCUPANCY

1. **Once construction is completed and the building is ready to be occupied, the applicant may apply for a Certificate of Occupancy (CO). Prior to applying for the CO the applicant shall submit a partial as-built development site plan survey for review. In coordination with the Certificate of Occupancy Survey/Partial As-Built Checklist, the landscape related items which must be verified on the partial as-built plan include:**
  - a. Locations of tree wells, surface BMPs, landscape strips and planters, dimensioned from a fixed point such as the building or property line.
  - b. Dimensions of tree wells, landscape strips, planting areas and planters.
  - c. Distance of street trees from above-grade utilities, including light poles.
  - d. Quantity and species of street trees, and trees and shrubs counted toward canopy cover requirements.
  - e. A certification letter prepared by the project landscape architect that certifies all trees planted within the public right of way and on public land are installed in compliance with approved drawings and specifications. This letter must be signed and sealed by the project landscape architect.
  - f. Refer to the City's as-built stormwater management requirements for structural BMPs and detention facilities.
2. **Once the partial as-built plan is submitted, the P&Z project manager will review the plans for compliance with the above information and that all conditions of approval required prior to issuance of the first CO are satisfied. If the plans and conditions are complete, the P&Z project manager will perform a site inspection to verify the surveyed information is consistent with the approved Final Site Plan. The landscape related items to be inspected include:**
  - a. Location, quantity, and species of street trees, and trees and shrubs counted toward canopy cover requirements.
  - b. Condition of street trees, and trees and shrubs counted toward canopy cover.
  - c. Installation of trees and other vegetation, including guying and/or staking of trees, pursuant to the City's Standard Planting Details.
3. **The P&Z project manager may provide a punchlist of outstanding items that must be addressed prior to occupancy. Once all punchlist items have been corrected, the applicant will submit an updated partial as-built survey and the P&Z project manager will perform a subsequent inspection.**

4. Once all items have been satisfied, the P&Z project manager may approve of the CO. On a case by case basis, staff may agree to a temporary certificate of occupancy, based on the outstanding items that need to be addressed prior to a permanent CO.

## PERFORMANCE BOND

1. After construction of a development project is complete and the final CO has been issued, the applicant can request the release of the project's Performance Bond by submitting a complete as-built site plan. In coordination with the [As-Built Development Plan Review Checklist](#), the landscape related items which must be verified on the as-built site plan include:
  - a. Locations of tree wells, surface BMPs, landscape strips and planters, dimensioned from a fixed point such as the building or property line.
  - b. Dimensions of tree wells, landscape strips, planting areas and planters.
  - c. Distance of street trees from above-grade utilities, including light poles.
  - d. All plant quantities and species with planting list/schedule, including surface BMPs.
2. Once the as-built plan is submitted, the P&Z project manager will review the plans for compliance with the above information and that all conditions of approval required prior to release of the Performance Bond are satisfied. If the plans and conditions are complete, the P&Z project manager will perform a site inspection to verify the surveyed information is consistent with the approved Final Site Plan. The landscape related items to be inspected include:
  - a. Location, quantity, and species of all vegetation.
    - i. For groundcover areas or other planting areas with large swaths of low-growing perennial plantings where individual plants are difficult to distinguish, the P&Z project manager shall inspect the planting area to ensure it is fully planted and note any areas of bare mulch or soil and dead/dying plant material on the punch list.
  - b. Condition of street trees and all other vegetation.
  - c. Installation of trees and other vegetation, including guying and/or staking of trees, pursuant to the City's Standard Proposed Planting Details.
3. The P&Z project manager may provide a punchlist of outstanding items that must be addressed prior to release of the Performance Bond. Once all punchlist items have been corrected, the applicant will submit an updated as-built site plan and the P&Z project manager will perform a subsequent inspection.
4. Once all items have been satisfied and all departments have approved the as-built site plan, the Performance Bond will be released, with ten (10) percent of the Performance Bond amount held by the City as a Maintenance Bond. A signature set of the approved as-built site plan is submitted by the applicant then signed and stored by the Director of Transportation & Environmental Services.



## MAINTENANCE BOND

1. When the Performance Bond is reduced to a Maintenance Bond, a follow-up inspection for all items still under bond is performed one (1) year following the release of the Performance Bond. Using the approved as-built site plan, the P&Z project manager will perform an inspection to verify the conditions on the site are still correct per the approved plan.
2. The applicant shall provide a completed annual invasive plant species monitoring and management report, as applicable, prepared pursuant to Chapter 3 at the time of the Maintenance Bond inspection.
3. If the site is not in compliance with the approved as-built site plan, the P&Z project manager may provide a punchlist of items to be corrected, which will be compiled by the Development Coordinator and distributed to the applicant.
4. Once all departments determine the site is in compliance with the approved as-built site plan, the Maintenance Bond can be released for all except the landscape bonded items.
  - a. The remaining landscape bond items shall be inspected again, three (3) years after release of the Performance Bond and following the same procedure for landscape maintenance inspection one (1) year after the Performance Bond is released.
    - i. Once all items have been satisfied, the remainder of the bond may be released and the development project shall then be considered complete.

# Maintenance

## OVERVIEW

The intent of landscape maintenance is to promote healthy natural and urban environments through proper management of vegetation. The City's maintenance standards provide a framework to ensure optimal plant health in order to maximize the opportunity for vegetation to mature and reach its fullest potential, and therefore provide the greatest environmental benefits.

## STANDARDS

All plantings shall be consistently maintained in a flourishing and vigorous growing condition by the applicant, owner, and/or successor(s) of the property beginning on the date of installation and according to the following performance standards:



1. **The scope of work required for any site maintenance contract or plan shall include, but is not limited to:**
  - a. Periodic inspection of all planting areas, including lawn, to include removal of fallen leaves/plant debris and litter from planting beds and pedestrian travel ways, as needed.
  - b. Seasonal maintenance to be completed at the beginning of the fall and spring planting seasons, including:
    - i. Removal and replacement of dead, diseased, or dying or severely damaged plantings.
      1. Dead or fatally damaged planting materials are those that do not show vigorous, hardy and sustained growth characteristics on seventy-five (75) percent of the specimen.
      2. Trees shall be considered dead or terminally damaged when the main leader has died back and/or if twenty-five (25) percent of the crown does not show vigorous, hardy and sustained growth.
      3. Trees should have no visible cankers, wounds, or holes.
    - ii. Application of an organic, slow-release fertilizer only as recommended as a result of soil sample testing.
    - iii. Pruning of trees, shrubs and groundcovers, including:
      1. Street Trees:
        - a. Street trees that overhang pedestrian pathways shall be pruned to a branching clearance height of seven (7) vertical feet from adjacent finished grade at the time of planting.
        - b. Street trees that overhang roadways should be limbed up twelve (12) to fourteen (14) feet above the adjacent finished grade of the roadway.
        - c. Clearances shall be achieved by judicious pruning and not necessarily removing all limbs along the trunk or main stem of the tree to the recommended height.
        - d. Pruning activity shall occur according to ANSI standards.

2. Shrubs used for screening shall be pruned as a mass to enhance their natural form and maintain a vertical height between two (2) feet and three (3) feet continuous overall.
3. Prune groundcover to retain its natural growing habit within planting beds or borders. Restrict groundcover from invading or overcoming adjacent plants.
- iv. Removal of dead, diseased, insect-infested, or weak wood shall take place in the dormant season, after flowering, or as needed to achieve pest or disease control measures.
- v. Excessive shoots and suckers shall be removed.
- vi. Insect and disease control performed by trained and certified personnel, as needed.
- vii. Installation of mulch in planting beds and around trees and restoration of planting saucers and bed liners.
- viii. Weed management in turfgrass areas and landscape beds.
- c. Turfgrass management
  - i. Lawn areas shall:
    1. Be cut routinely in for the health of the species and shall in no case exceed the height set forth in [Chapter 9 of the City of Alexandria Code of Ordinances](#).
    2. Maintain a uniform appearance free of weeds and areas of bare soil.
    3. Avoid browning or yellowing through regular watering unless a water shortage condition or water supply emergency is declared by the City.
- d. Watering, if not provided by an automatic or semi-automatic system. Refer to Chapter 4 for irrigation standards.
- e. Edging of lawn and planting areas.
- f. Removal of installation materials (guy wires, stakes, flagging) shall occur one (1) year after installation.

## 2. Maintenance Plan

- a. A landscape maintenance plan shall be submitted to the with the As-Built Performance Bond package. The maintenance plan shall:
  - i. Identify the individual(s) or company(s) responsible for performing the landscape maintenance. Contact information including the name, title, phone number and email address of the primary contact shall be provided.
  - ii. Provide, at a minimum, the services outlined in Part 1 of this Section.

### 3. Plant Substitutions

- a. If building management or the property owner would like to make substitutions to the approved plant material, they may do so through the following procedure:
  - i. A letter from the project Landscape Architect shall be submitted to the Department of Planning and Zoning (P&Z) project manager requesting any changes to the approved plantings on the plan. The letter shall include a list of the quantities, types and sizes of the original plant material and the proposed substitution, with the location shown on the plan.
  - ii. The substitution shall not reduce the number of plants approved on the plan, nor shall it reduce the crown coverage for the site.
  - iii. There shall be no significant change in the size, characteristics, percentage of native species, biodiversity standards, or location of the plant materials.
  - iv. The P&Z project manager shall provide written confirmation of the plant substitution(s). No substitution(s) may occur without written acceptance of the plant substitution(s) by the City.
- b. If the proposed substitutions constitute thirty (30) percent or more of the approved vegetated area and/or quantity of plants, a site plan amendment may be required as determined by the City.





# 6 References and Appendices

- Reference Standards
- City Standard Landscape Details
- Standard Landscape Plan Notes
- Plant Lists and Canopy Coverage Allowances
- Invasive Plant Lists
- City Plans and Standards Links

The following standards, details, references, and other information provided via the following links and external documents may be updated regularly. For the most current version, please make sure to utilize the online version.

## Reference Standards

(future link)

## City Standard Landscape Details

(future link)

## Standard Landscape Plan Notes

(future link)

## Plant Lists and Canopy Coverage Allowances

(future link)

## Invasive Plant Lists

(future link)

## City Plans and Standards Links

(future link)





CITY OF ALEXANDRIA, VIRGINIA