

# Landscape Guidelines

City of Alexandria, Virginia

April, 2007



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# Introduction

The purpose of the Landscape Guidelines is to incorporate thoughtful, up-front ecologically based landscape planning as a means of improving the quality of the environment within the City while reducing maintenance requirements and costs over-time. The intent of the Landscape Guidelines is to provide predictable review expectations and processes for preservation of existing vegetation and selection of proposed plantings accompanying site disturbance and development.

The Landscape Guidelines establish minimum standards for the protection and preservation of existing vegetation; crown area coverage; installation and maintenance of proposed plantings - including street trees, site plantings, plantings above structure and plantings in parking and bioretention areas. The standards include industry references for plant specification, special project conditions and installation, as well as guidance on invasive species, landscape irrigation/water management, post construction procedures and maintenance.

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

The Landscape Guidelines are intended for use of property owners, developers, and applicants seeking Site Plan, Plot Plan, Development Special Use Permit, and/or Special Use Permit approval within the City of Alexandria, Virginia.

Updated                      April, 2007  
   December, 1997 (first edition)

# I. Standards and Requirements

## Reference Standards

### A. Specification, Grading and Nomenclature

Plant material, materials and methods of horticultural standardization and landscape/planting/maintenance operations shall be in accordance with the most current and up to date edition of the following:

1. American Standard for Nursery Stock. ANSI-Z60.1  
As published by the American Association of Nurserymen; Washington, DC.
2. Hortus III. Nomenclature for Plants. By L.H. Bailey Hortorium; Cornell University; Ithaca, New York.
3. Manual of Woody Plants: Their Identification, Ornamental Characteristics, Culture, Propagation and Uses.  
By Michael A. Dirr. As published by Stipes Publishing Company; Champaign, Illinois.
4. Landscape Specification Guidelines. As published by the Landscape Contractors Association  
of Maryland, District of Columbia and Virginia; Gaithersburg, Maryland.
5. Alexandria City Code. City of Alexandria, Virginia.
6. Zoning Ordinance of the City of Alexandria. City of Alexandria, Virginia.
7. Guideline Specifications for Sodding. As published by the American Sod Producer's Association; Washington, DC.
8. Virginia Cooperative Extension Serviced Bulletins.  
As published by the Commonwealth of Virginia Cooperative Extension Service.
9. Design Manual For Use of Bio-retention in Stormwater Management.  
As published by the Prince George's County, Maryland.
10. Standard Practices for Trees, Shrubs, and Other Woody Plant Maintenance. ANSI-A300  
As published by the International Society of Arboriculture; Savoy, Illinois.
11. Pruning Standards. ANSI-A300 As published by the International Society of Arboriculture; Savoy, Illinois.
12. Support System Standards. ANSI-A300 As published by the International Society of Arboriculture; Savoy, Illinois.
13. Tree Fertilization Standards. ANSI-A300 As published by the International Society of Arboriculture; Savoy, Illinois.
14. Standard Practices for Tree Care Operations-Pruning, Trimming, Repairing, Maintenance, Removing Trees,  
and Cutting Brush-Safety Requirements. ANSI-Z133.1  
As published by the International Society of Arboriculture; Savoy, Illinois.

**Note: In the event that standards conflict/ differ the most restrictive approved standard shall prevail.**

# I. Standards and Requirements

## Landscape Plan Submission Requirements

### A. Drawing Scale and Orientation

1. All landscape drawing submissions shall be provided at an industry standard architecture or engineering reference scale.
  - a. Minimum scale 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. Landscape drawings shall be submitted with geodetic or plan north oriented consistently with site engineering and architecture documents.

### B. Graphic Reference Symbols

1. To accurately represent crown area of plantings proposed in landscape drawing submissions, circles, symbols or other representations shall graphically differentiate between shade, ornamental and evergreen trees and be drawn to scale using the following maximum dimensions for representation:
  - a. Shade Trees: thirty (30) feet total canopy diameter
  - b. Ornamental Trees: fifteen (15) feet total canopy diameter
  - c. Evergreen Trees: ten (10) feet total canopy diameter

### C. Information on Documents and Drawing Submissions

1. Landscape drawing submissions shall fix 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 be of sufficient detail and of professional quality to enable comprehensive review.

# I. Standards and Requirements

## Landscape Plan Submission Requirements

### C. Information on Documents and Drawing Submissions (continued)

2. Landscape plan submissions shall include, but not be limited to documentation of the following:
  - a. Project site and context including neighboring sites, vegetation and Resource Protection Areas.
  - b. All land disturbing activities and limits of work.
  - c. Phasing, future development, temporary uses and timing of construction if applicable.
  - d. Existing vegetation including quantity, species, caliper size and height.
  - e. Existing vegetation on adjacent sites that will be affected by proposed work/ site disturbance.
  - f. Existing vegetation to be removed, and/or preserved/remain.
  - g. Measures to protect existing vegetation to be preserved/remain/relocated.
  - h. Location, spacing, quantity, species, size, height/spread, culture and character of all proposed plantings at time of installation.
  - i. Plant Legend/Index or Schedule that indicates the species, specification, character, height/spread, size and total quantity of all proposed plantings at time of installation.
  - j. 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.
  - k. Grass areas and limits, including identification of sod and/or seed areas.
  - l. Slope areas in excess of four to one (4:1) or twenty-five (25) percent.
  - m. Drainage ways, yard inlets, area drains and overflow areas.
  - n. Existing and proposed location of above and below grade site utilities and service connections including Fire Department Connections, easements and access requirements.
  - o. Location and direction of service openings on above grade utilities such as transformers, telephone, air conditioning/heating units and cable boxes. Specifically indicate perimeter clearance/safety zones.
  - p. Specification and location for landscape accessories such as tree grates, temporary or moveable planters, street and site lighting, site furnishings, paving, pervious emergency vehicle access, etc.
  - q. Landscape irrigation/water management system.
  - r. Crown Coverage Area calculations indicating existing conditions, changes (additions/deletions).
  - s. Existing, required and proposed open space, and/or applicable contributions in feet and acres.
  - t. Vision clearance areas/zones for vehicles, pedestrians and traffic control devices.
  - u. All necessary dimensions, distances, quantities and clearances.

# I. Standards and Requirements

## Landscape Plan Submission Requirements

### **D. 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 certified to practice in the Commonwealth of Virginia.
2. 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.
3. At determination of the City, an Arborist professionally certified/registered by the International Society of Arboriculture (ISA) and/or American Society for Consulting Arborists (ASCA) shall be retained by the owner/applicant/successor. The Arborist shall engage in project activities including protection/preservation of existing vegetation, review of introduced plantings and post construction analysis.

### **E. Required Notes on Drawing Submissions**

1. Notes on Drawing Submissions shall be in accordance with Figure I-A.

# I. Standards and Requirements

## Protection and Preservation of Existing Vegetation

### A. Inventory and Identification Procedures

A tree inventory and survey shall identify the species, and using accepted industry standards-accurately evaluate the condition of trees on the site. Inventory and survey shall include:

1. Individual trees in relationship to adjacent topography/grade conditions.
2. Species documented with common and horticultural names.
3. Size as caliper and/or when applicable by height.
4. Shrubs as groups/sized by height.

### B. Special Conditions

1. At determination of the City, the applicant may be required to 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 provide methods and recommendations for protection and preservation of existing vegetation and as outlined in these guidelines.
2. Densely wooded, environmentally sensitive or ecologically important sites require extensive and detailed study.
  - a. At the determination of the City Arborist, a forest stand delineation and species rating inventory shall be required.
  - b. Species rating inventory shall be developed in compliance with the Mid Atlantic Tree Species Rating Guide, as published by the Mid-Atlantic Chapter of the International Society of Arboriculture (MAC-ISA)
  - c. At determination of the Directors of Planning & Zoning, Transportation & Environmental Services, and Recreation, Parks & Cultural Activities, special areas such as easements or other conservation mechanisms may be recommended.



# I. Standards and Requirements

## Protection and Preservation of Existing Vegetation

### B. Special Conditions (continued)

3. Specimen trees or vegetation associated with an historic/significant landscape, ethnographic or cultural site will require extensive and detailed review.
  - a. At determination of the City, an assessment of physical attributes and features and biotic systems may be required.
  - b. Site assessment shall include specialized research, documentation, analysis, evaluation and treatment recommendations generally consistent with the US Department of Interior's standards for historic landscapes and preparation of cultural landscape reports.

### C. Methods and Procedures

1. Vegetation protection zones shall be depicted and documented on all development related drawings that depict work affecting the protection and preservation of existing vegetation. Drawings and documents shall include:
  - a. Site/building demolition.
  - b. Sediment and erosion control.
  - c. Site utilities and architectural features.
2. Vegetation designated for protection and/or preservation shall be enclosed in a protection zone that establishes limits of construction disturbance to the root area of designated plant material.
3. Fencing shall be installed at the perimeter of all protection zones.  
Fencing shall be installed in accordance with Figure I-B.
4. Approved fencing materials shall be in accordance with the following minimum dimensional requirements:
  - a. Less than fifteen (15) feet from vegetation to be protected, provide chain link or wood fence.
  - b. Greater than fifteen (15) feet from vegetation to be protected, provide plastic or wood snow fence.
  - c. Silt, erosion control or geotechnical fabric materials are not acceptable for use as fence.
  - d. For specially designated, specimen quality, historic, or culturally significant vegetation, provide extraordinary measures as directed by the City Arborist.
5. Type of vegetation protection and/or preservation material may vary due to site disturbance limits and proximity to designated vegetation, special or paved areas.

# I. Standards and Requirements

## Protection and Preservation of Existing Vegetation

### C. Methods and Procedures (continued)

6. Prior to commencement of construction and at any change of project phasing, the following protection items shall be verified and approved in field by the City Arborist:
  - a. Location and establishment.
  - b. Installation procedures and methods.
  - c. Anticipated phasing and timing of construction.
  - d. Maintenance procedures, methods and measures.
  
7. Prior to any alteration of site conditions, the following items shall be verified and approved in-field by the City Arborist:
  - a. Changes, alterations or modification to protection zones.
  - b. Removal of protection fencing.
  - c. Site disturbing activities within designated protection zones including root pruning, modification or restoration of grade conditions.
  
8. Areas which encompass groupings, or individual specimen vegetation designated for protection and/or preservation shall not be violated (approved maintenance procedures and watering excepted) throughout the entire construction period. Prohibited items/activities include, but are not limited to:
  - a. 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.
  - b. Felling and storing vegetation.
  - c. Incinerating materials within or in close proximity.
  - d. Operating machinery or equipment, including vehicle/equipment parking or storage.
  - e. Temporary or permanent utility construction, paving or impervious surface installation.
  - f. Disposal of debris or chemicals.
  - g. Temporary facilities or occupation by work force.

# I. Standards and Requirements

## Protection and Preservation of Existing Vegetation

### C. Methods and Procedures (continued)

9. When proposed development impacts existing vegetation on neighboring properties, prior to commencement of construction, provide the following:
  - a. Documentation that includes; notification of construction impact, timing/schedule/phasing, potential for loss or damage, and agreed upon remedial measures should loss or damage occur.
  - b. Certified communication with the subject owner(s) and jointly approved binding agreement between affected parties.
  
10. When proposed development impacts existing vegetation within a Resource Protection Area (RPA) provide the following:
  - a. Water Quality Assessment as approved by the City.
  - b. Evidence of quality and quantity mitigation consistent with Riparian Buffer Modification and Mitigation practices as available through the Commonwealth of Virginia, Department of Conservation and Recreation. Reference <http://www.state.va.us/dnh/>

### D. Maintenance

Vegetation designated for protection and/or preservation shall continuously receive an enhanced level of maintenance throughout the entire construction period.

1. Maintenance shall be pro-active.
2. Maintenance operations shall aggressively monitor the health, growth and vigor of vegetation and prescribe approved selective pruning, removal of volunteer and/or invasive species, watering, fertilization and installation of mulch/topdressing.
3. Maintenance shall be performed to the satisfaction of the City Arborist.

# I. Standards and Requirements

## Protection and Preservation of Existing Vegetation

### E. Replacement of Damaged Vegetation

In-kind\* replacement of damaged existing vegetation shall be located on private or public lands to the satisfaction of the City Arborist.

1. At determination of the City Arborist, egregious or severe damage to vegetation shall require an additional review of the project's site plan and/or Special Use Permit approval. Amendment procedures may be required.
2. In-kind\* replacement of damaged vegetation shall at a minimum be performed in accordance with the following:
  - a. One (1) tree (in accordance with Section II and III) per caliper inch of the sum total caliper inch measurement of tree(s) deemed severely or terminally damaged.
  - b. Grouping of vegetation such as shrubs or other woody plants at an installation size and quantity to satisfaction of the City Arborist and Directors of Planning & Zoning, Recreation, Parks & Cultural Activities and Transportation & Environmental Services.
3. Monetary remuneration (based on value equal to in-kind\* replacement) may be required on sites where full or partial replacement is not practical.
  - a. Monetary value shall be based on the current market rate for specification, procurement, installation and warranty of trees (in accordance with Section II and III) and as referenced in the City's requirements for bonding of landscape materials.
  - b. Contributions, penalties and remuneration shall be dedicated to the City to the satisfaction of the Director of Recreation, Parks & Cultural Activities.
4. Applicant, owner or successor liability for replacement of damaged vegetation shall extend for a period of two calendar years from date of the last and final project Certificate of Occupancy.

\* "In-kind" refers to the species, character and projected mature size of subject vegetation.

Remedy requirements shall be determined and undertaken to the satisfaction of the City Arborist.

# I. Standards and Requirements

## Figure I-A. Required Notes on Drawing Submissions

1. All protection and preservation measures for existing vegetation, including maintenance shall be approved by the City Arborist in-field prior to commencement of any site disturbing activity.
2. 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 the American Association of Nurserymen; Washington, DC.
3. The applicant has made suitable arrangements for pre-selection tagging, pre-contract growing, or is undertaking specialized planting stock development with a nursery or grower that is conveniently located to the project site, other procedures that will ensure availability of specified materials. In the event that shortages and/or inability to obtain specified plantings occurs, remedial efforts including species changes, additional plantings and modification to the landscape plan shall be undertaken by the applicant. All remedial efforts shall, with prior approval by the city, be performed to the satisfaction of the Directors of Planning & Zoning, Recreation, Parks & Cultural Activities and Transportation & Environmental Services.
4. In lieu of more strenuous specifications, all landscape related work shall be installed and maintained in accordance with the current and most up-to-date edition (at time of construction) of Landscape Specification Guidelines as produced by the Landscape Contractors Association of Maryland, District of Columbia and Virginia; Gaithersburg, Maryland.
5. Prior to commencement of landscape installation/planting operations, a pre-installation/construction meeting will be scheduled with the City's Arborist and Landscape Architects to review the scope of installation procedures and processes.

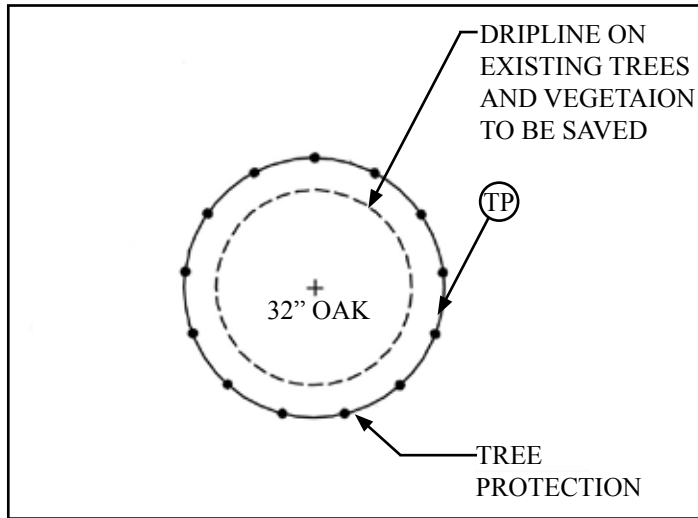
## I. Standards and Requirements

### Figure I-A. Required Notes on Drawing Submissions (continued)

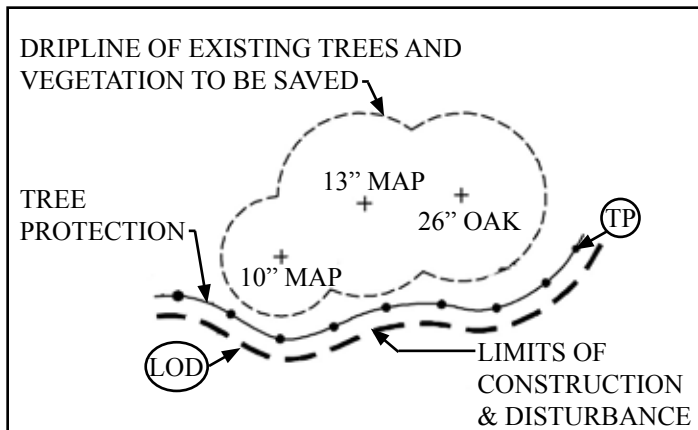
6. Maintenance for this project shall be performed in perpetuity, in compliance with City of Alexandria Landscape Guidelines and/or as conditioned by project approval.
7. A certification letter for tree wells, tree trenches and plantings above structure shall be provided by the project's Landscape Architect. The letter shall certify that all below grade construction is in compliance with approved drawings and specifications. The letter shall be submitted to the City Arborist and approved prior to approval of the last and final Certificate of Occupancy for the project. The letter shall be submitted by the owner/applicant/successor and sealed and dated as approved by the project's Landscape Architect.
8. As-built drawings for this landscape and/or irrigation/water management system will be provided in compliance with City of Alexandria Landscape Guidelines. As-built drawings shall include clear identification of all variation(s) and changes from approved drawings including location, quantity and specification of all project elements.

# I. Standards and Requirements

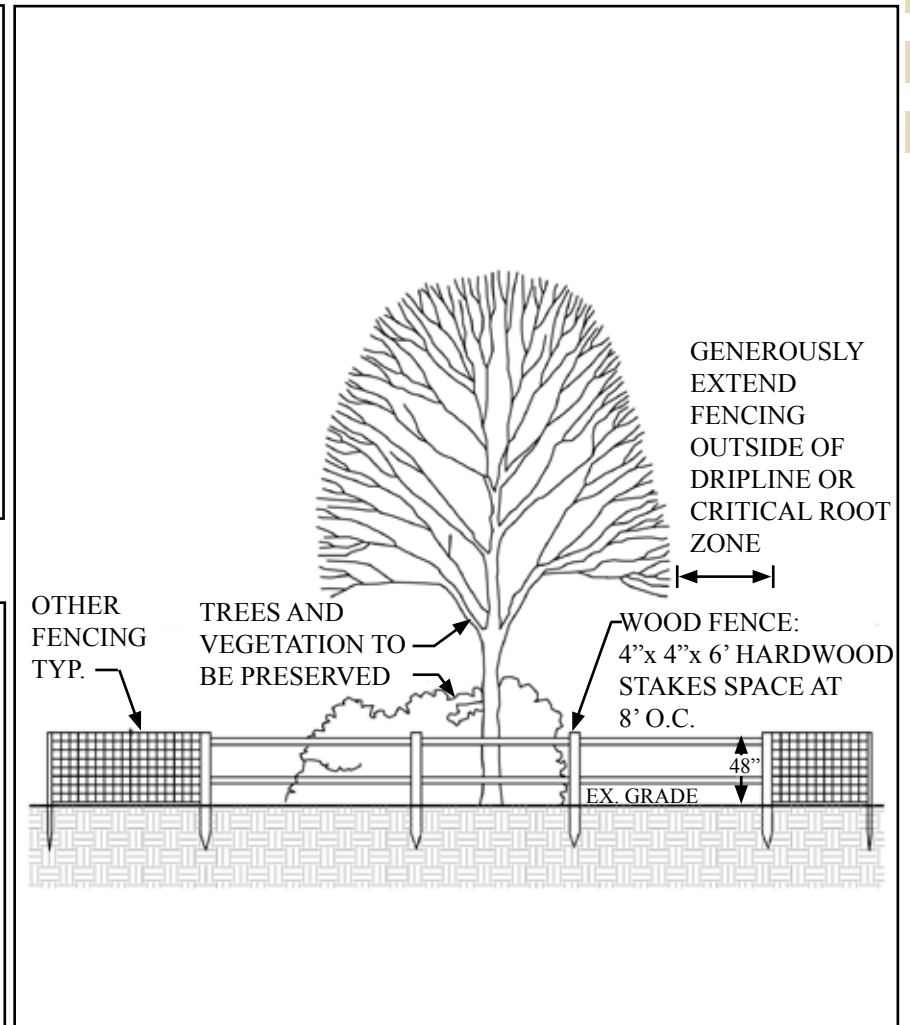
Figure I-B. Tree Protection



PLAN VIEW: SINGLE SPECIMEN



PLAN VIEW: VEGETATION



VEGETATION PROTECTION AND PRESERVATION DETAIL SECTION

## II. Landscape Plan Preparation

### Specification of Plant Material

#### A. Tree Specification and Installation

Trees to be installed shall meet the following minimum size requirements:

##### 1. Shade Trees

- a. Shade Trees Type I: Two to two and one-half (2.0-2.5) inches in caliper;  
Twelve to fourteen (12-14) feet in height.
- b. Shade Tree Type II: Three and one-half to four (3.5-4) inches in caliper;  
Sixteen to eighteen (16-18) feet in height.  
For use in density urban areas, coordinated development districts,  
shade trees in high visibility rights of ways and major arterial streets.

Caliper refers to the diameter of a tree, measured at a point six (6) inches above the ground line if the resulting measurement is not more than four (4) inches. If the resulting measurement is more than four (4) inches, the measurement is made at a point twelve (12) inches above the ground line. Note: These procedures vary from the timber/forestry industries, which provide caliper measurement at a point four and one-half (4.5) feet above average grade or ground level.

##### 2. Ornamental Trees

- a. Ornamental Trees Type I: Eight (8) feet in height.
- b. Ornamental Trees Type II: Ten (10) feet in height. For use as street trees.

##### 3. Evergreen Trees

- a. Evergreen Trees Eight (8) feet in height.

##### 4. Branching Height

- a. Minimum branching height shall be measured from top of root flare to first branch. Root Flare indicates the area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
- b. As determined by the City Arborist based on size at installation, growth habit and horticultural characteristics of individual species.



## II. Landscape Plan Preparation

### Specification of Plant Material

#### B. Shrub Specification and Installation

##### 1. General

- a. Appropriate sizes for shrubs shall be determined based on proposed location, design intent, anticipated mature size, site and environmental conditions.
- b. Spacing requirements, maintained height and spread shall be determined and approved during the landscape plan submission review process.
- c. Regardless of quantities indicated on drawings, all designated areas shall be filled to capacity with plants at the approved spacing.

##### 2. Parking Screening Plantings

- a. Required continuous and uninterrupted for parking areas adjacent to, or visible from the public right-of-way.
- b. Minimum maintained vertical height of two and one-half (2.5) feet continuous overall.
- c. Maximum maintained vertical height three and one-third (3.3) feet continuous overall.
- d. Locate set back two and one-half (2.5) feet from back of nearest curb to prevent damage by vehicle parking. If wheelstops are used, setback may not be required.
- e. Do not prune, shear, or shape as individual plants. Plantings shall become established and flourish in a natural growth habit, as a solid and continuous uninterrupted plant mass.

## II. Landscape Plan Preparation

### Specification of Plant Material

#### C. Groundcover and Perennial Specification and Installation

##### 1. General

- a. Specify and install at a size and spacing to provide uniform, vigorous, non-invasive growth habit.
- b. Regardless of quantities indicated on drawings, all designated areas shall be filled to capacity with plants at the approved spacing.
- c. Specify and install at a spacing and size to achieve a size, scale, and character, including ninety (90) percent uniform coverage of the overall design intent, within two (2) calendar years from date of the last and final certificate of occupancy.

#### D. Turf Specification and Installation

##### 1. General

- a. Species and mixes shall be of superior specification as approved and certified by the Virginia Department of Agriculture, Virginia Cooperative Extension Service and University of Maryland.
- b. When installed in “turf-block”, “turf-ring”, reinforced-turf emergency vehicle access areas, or other similar applications, an automated irrigation system is required.

##### 2. Sod

- a. Free of noxious weeds, non-turfgrass plants, unspecified growth, soil borne insects and disease.
- b. Of a uniform non-varying density and continuous texture quality capable of growth and development immediately upon installation.
- c. Specify for use in “turf-block”, “turf-ring”, or reinforced-turf emergency vehicle access areas.

##### 3. Seed

- a. Procure from new of the year seed crops, free of foreign material or weed seeds.
- b. Replacement or overseeding mixes shall match or compliment original installation.
- c. Provide continuous uniform and consistent coverage.

## II. Landscape Plan Preparation

### Street Trees

#### A. Street Tree Specification and Installation

1. Street trees include all existing and proposed trees within the right-of-way (ROW).
  - a. Street trees are required for projects requiring site plan or special use permit approval or involving property adjacent to the public right of way.
  - b. Species, Size and Specification. Street trees shall be approved for each individual project by the City Arborist. Species shall remain constant along the entire individual length of a block face or site development. Shade and ornamental street trees shall be single leader (no multi-trunk trees).
  - c. As street trees mature, each shall be limbed to a height of seven (7) feet as measured from immediately adjacent finish grade.
  - d. Overhead utilities. In areas where overhead utilities are present and/or conflict with street trees, ornamental trees shall be specified.
  - e. Spacing of street trees shall correspond to the categories of trees indicated below. Spacing may be adjusted to accommodate special site conditions such as bus stops.

#### Maximum spacing requirements:

1. Shade Trees: One street tree is required for every thirty (30) linear feet of right-of-way or lot frontage.  
Specify at thirty (30) feet on-center (o.c.) spacing.
2. Ornamental Trees: One street tree is required for every twenty (20) linear feet of right-of-way or lot frontage.  
Specify at twenty (20) feet on-center (o.c.) spacing.
3. Evergreen Trees: Do not use as street trees.

## II. Landscape Plan Preparation

### Street Trees

#### B. Street Trees in Tree Wells

1. Exposed surface area of tree wells shall be a minimum of four (4) by ten (10) feet. Larger dimensions shall be required if deemed appropriate by the City Arborist, or required as a part of the Site Plan process.
2. Tree wells shall support a subsurface tree trench large enough to provide sufficient arable soil volume and adequate moisture for individual trees. Tree trenches shall hold a minimum volume of three-hundred (300) cubic feet per tree.
3. Dependent upon project conditions and at determination of the City Arborist, tree wells shall be:
  - a. Planted with a hardy evergreen ground cover.
  - b. Planted with grass sod.
  - c. Covered with tree grates of a size, shape, material and design approved by the City Arborist.  
In densely urban or areas of high pedestrian traffic volume, tree grates are preferred (Figure II-A).

#### C. Street Trees in Planting Strips

1. Planting strips for existing conditions shall be a minimum of two and one-half (2.5) feet, in continuous width between adjacent pavement and back of curb.
2. Planting strips for new development shall be a minimum of four (4) feet, in continuous width between adjacent pavement and back of curb.
3. Street trees in planting strips shall be installed in compliance with Figure II-C.

## II. Landscape Plan Preparation

### Landscape Breaks in Parking Area

#### A. Requirements

Parking areas shall be designed to accommodate landscape islands for installation of plantings.

Landscape islands on the interior of parking areas shall include tree(s) and low plantings or turf grass sod.

##### 1. Quantity

- a. 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.

##### 2. Location

- a. Landscape islands shall be incorporated into the ends of all parking rows, sides of ingress/egress aisles and pedestrian access ways.

##### 3. Dimensions

- a. Landscape islands shall be at a minimum, the dimension of immediately adjacent parking spaces.
- b. To provide greatest opportunity for healthy establishment and long term sustainability of vegetation, at least double the dimension of immediately adjacent parking spaces is recommended.

Examples using standard parking dimensions:

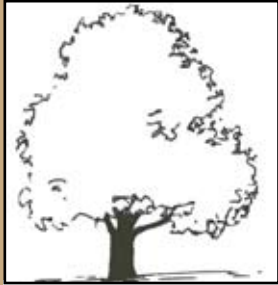
- a. One (1) space= nine (9) x eighteen (18) feet. Recommended dimension: eighteen (18) x eighteen (18) feet.
- b. Two (2) spaces in tandem = nine (9) x thirty-six (36) feet.  
Recommended dimension: eighteen (18) x thirty-six (36) feet.
- c. Four (4) spaces in tandem pairs = eighteen (18) x thirty-six (36) feet.

##### 4. Coordination

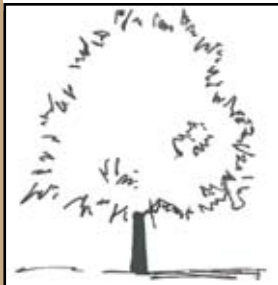
- a. Recommended Species. Large and Medium shade trees.
- b. Due to heat and drought stress and vision clearances, ornamental and evergreen trees are not recommended.
- c. Minimize conflicts between plantings and pedestrian circulation, emergency vehicle access, light poles, signs and site utilities.

## II. Landscape Plan Preparation

### Recommended Plant List



*Acer rubrum*



*Platanus x acerifolia*



*Quercus phellos*



*Ulmus americana*

This list is not intended to be all-inclusive and is an example of acceptable varieties and species. New horticultural varieties and species are continuously introduced in the nursery industry. The City encourages consideration of alternative species and varieties to promote diversity in its urban forest. Trees other than those listed may be substituted with approval of the City Arborist as a normal component of landscape plan submission review process.

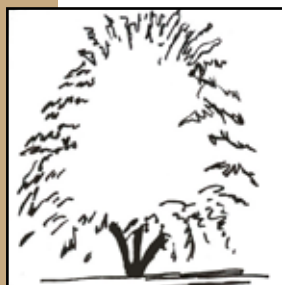
#### A. Large Shade Tree:

**Crown Coverage Allowance (CCA)= 1,250 square feet each**

<u>Botanical Name</u>	<u>Common Name</u>	<u>CCA</u>	<u>Cultivar(s)/ Notes</u>
<i>Acer rubrum</i>	Red Maple	1,250	'October Glory', 'Red Sunset'
<i>Acer sacharum</i>	Sugar Maple	1,250	'Bonfire', 'Commemoration', 'Legacy'
<i>Fagus grandifolia</i>	American Beech	1,250	
<i>Liquidambar styraciflua</i>	Sweetgum	1,250	'Rotundifolia'
<i>Platanus x acerifolia</i>	London Plane	1,250	'Bloodgood', 'Columbia', 'Liberty'
<i>Quercus alba</i>	White Oak	1,250	
<i>Quercus borealis</i>	Northern Red Oak	1,250	
<i>Quercus coccinea</i>	Scarlet Oak	1,250	
<i>Quercus phellos</i>	Willow Oak	1,250	
<i>Tilia americana</i>	American Linden	1,250	
<i>Tilia cordata</i>	Littleleaf Linden	1,250	'Greenspire'
<i>Tilia tomentosa</i>	Silver Linden	1,250	'Green Mountain'
<i>Ulmus americana</i>	American Elm	1,250	'Princeton', 'Liberty', 'Valley Forge', 'Delaware #2', 'New Harmony', 'Washington'
<i>Ulmus parvifolia</i>	Chinese Elm	1,250	'Allee', 'Athena', 'Dynasty', 'Ohio', 'Pathfinder'

## II. Landscape Plan Preparation

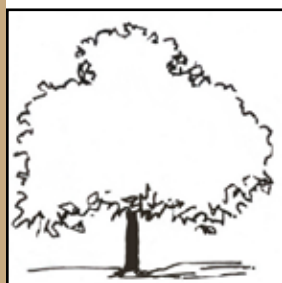
### Recommended Plant List



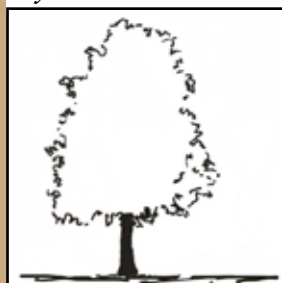
*Betula nigra*



*Gleditsia tricanthos*



*Gymnocladus dioicus*



*Oxydendrum arboretum*

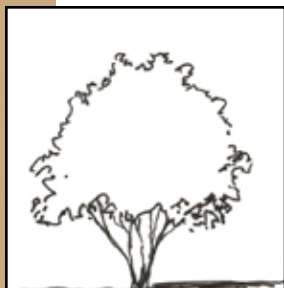
#### B. Medium Shade Tree:

**Crown Coverage Allowance (CCA) = 750 square feet each**

Botanical Name	Common Name	CCA	Cultivar(s)/Notes
<i>Aesculus x carnea</i>	Red Horsechestnut	750	'Briotii', 'Fort McNair', 'O'Neill'
<i>Aesculus hippocastanum</i>	Horsechestnut	750	
<i>Betula nigra</i>	River Birch	750	'Dura-heat', 'Heritage'
<i>Carpinus betulus</i>	European Birch	750	'Franz Fontaine'
<i>Cladrastis lutea</i>	American Yellowwood	750	
<i>Ginkgo biloba</i>	Ginkgo	750	'Autumn Gold', 'Princeton Sentry', 'Lakeview', 'Magyar' (male only)
<i>Gleditsia tricanthos</i> var. <i>inermis</i>	Thornless Honeylocust	750	'Shademaster', 'Halka', 'True Shade', 'Fairview', 'Imperial', 'Green Glory'
<i>Gymnocladus dioicus</i>	Kentucky Coffee Tree	750	'Expresso'
<i>Koelreuteria paniculata</i>	Golden Rain Tree	750	
<i>Nyssa sylvatica</i>	Black Tupelo Gum	750	
<i>Oxydendrum arboretum</i>	Sourwood	750	
<i>Quercus accutissima</i>	Sawtooth Oak	750	
<i>Sophora japonica</i>	Scholar Tree	750	'Millstone', 'Regent'
<i>Tilia cordata</i>	Littleleaf Linden	750	'Chancellor', 'Corinthian', 'Fairview', 'Glenleven', 'Greenspire', 'Olympic', 'Rancho', 'Shamrock'
<i>Zelkova serrata</i>	Japanese Zelkova	750	'Green Vase', 'Village Green', 'Halka'

## II. Landscape Plan Preparation

### Recommended Plant List



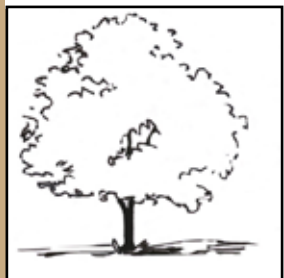
*Amelanchier arborea*



*Cercis canadensis*



*Pinus strobus*



*Magnolia x soulangiana*

### C. Medium Ornamental and Evergreen Tree:

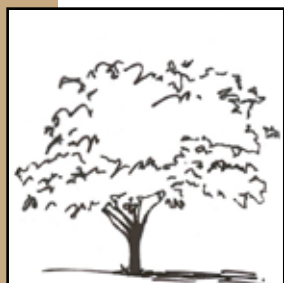
**Crown Coverage Allowance (CCA)= 500 square feet each**

Botanical Name	Common Name	CCA	Cultivar(s)/Notes
<i>Acer rubrum</i>	Red Maple	500	'Armstrong'/columnar
<i>Amelanchier arborea</i>	Serviceberry	500	
<i>Amelanchier x grandiflora</i>	Hybrid Serviceberry	500	'Autumn Brilliance', 'Majestic' 'Cole's Select', 'Snowcloud' 'Princess Diana', 'Glory', 'Tradition', 'Reflection', 'Spring'
<i>Cedrus deodara</i>	Deodara Cedar	500	
<i>Cercis canadensis</i>	Eastern Redbud	500	'Northern Strain'
<i>Cornus mas</i>	Cornelian Cherry	500	'Golden Glory'
<i>Cotinus obovatus</i>	American Smoketree	500	
<i>Chionanthus virginicus</i>	American Fringetree	500	
<i>Crataegus viridis</i>	Hawthorn	500	
<i>Magnolia grandiflora</i>	Southern Magnolia	500	evergreen
<i>Magnolia x soulangiana</i>	Saucer Magnolia	500	
<i>Ostrya virginiana</i>	Ironwood	500	
<i>Prunus sargentii</i>	Sargent Cherry	500	
<i>Prunus serrulata</i>	Cherry	500	'Kwanzan', 'Yoshino', 'Snow Goose', 'Accolade', 'Canada Red Select', 'Okame'
<i>Picea abies</i>	Norway Spruce	500	evergreen
<i>Pinus strobus</i>	White Pine	500	evergreen
<i>Tsuga canadensis</i>	Canadian Hemlock	500	evergreen
<i>Tsuga caroliniana</i>	Carolina Hemlock	500	evergreen

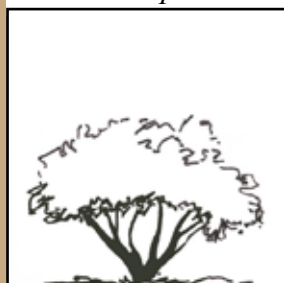


## II. Landscape Plan Preparation

### Recommended Plant List



*Acer palmatum*



*Franklinia alatamaha*



*Juniperus virginiana*



*Lagerstroemia indica*

#### D. Small Ornamental and Evergreen Tree:

Crown Coverage Allowance (CCA) = 250 square feet each

Botanical Name	Common Name	CCA	Cultivar(s)/Notes
<i>Acer ginnala</i>	Amur Maple	250	'Flame'
<i>Acer palmatum</i>	Japanese Maple	250	'Glowing Embers'
<i>Carpinus caroliniana</i>	American Hornbeam	250	
<i>Carpinus betulus</i>	European Hornbeam	250	'Fastigata'/columnar
<i>Ceridiphyllum japonicum</i>	Katsura Tree	500	
<i>Chionanthus virginicus</i>	White Fringe Tree	250	
<i>Cornus kousa</i>	Kousa Dogwood	250	
<i>Cryptomeria japonica</i>	Japanese Cryptomeria	250	evergreen
<i>Cupressocyparis leylandii</i>	Leyland Cypress	250	evergreen
<i>Franklinia alatamaha</i>	Franklinia	250	
<i>Halesia Carolina</i>	Silverbell	250	
<i>Ilex x attenuate</i>	Foster Holly	250	'Fosteri', 'Greenleaf' (mix males & females) evergreen
<i>Ilex x Nellie R. Stevens</i>	Nellie Stevens Holly	250	(mix males & females) evergreen
<i>Ilex opaca</i>	American Holly	250	(mix males & females) evergreen
<i>Juniperus virginiana</i>	Eastern Redcedar	250	evergreen
<i>Lagerstroemia indica</i>	Crape Myrtle	250	'Biloxi', 'Comanche', 'Natchez', 'Miami', 'Sioux', 'Catawba', 'Tuscarora', 'Yuma'
<i>Magnolia stellata</i>	Star Magnolia	250	
<i>Magnolia virginiana</i>	Sweetbay Magnolia	250	
<i>Malus Sp.</i>	Crabapple	250	(disease resistant cultivars only) 'Sprenger', 'Sugar Tyme', 'Snowdrift', 'Professor'
<i>Ostrya virginiana</i>	Ironwood	250	
<i>Pistacia chinensis</i>	Chinese Pistache	250	
<i>Syringia reticulate</i>	Tree Lilac	250	'Akebono', 'Ivory Silk', 'Regent' 'Summer Snow'
<i>Styrax japonica</i>	Japanese Snowbell	250	

## II. Landscape Plan Preparation

### Crown Coverage

#### A. Requirements

Approved Crown Coverage allowances are for shade, ornamental and evergreen trees, shrubs and bioretention planting. Categories are based upon the anticipated species size at maturity when located in an urban environment. Urban environments are not optimal conditions for sustaining growth and vigorous development when compared to nurseries or natural areas. Mature size will generally be reached in twenty (20) to forty (40) years. Designated crown coverage areas have been determined through review of the average spread and traditional growth performance of trees typically planted in Alexandria, Virginia.

##### 1. Street Trees

Street trees or other plantings in public right-of-way, on publicly dedicated lands, or off-site, do not apply toward crown coverage allowances.

##### 2. Pots & Planters

Plantings in pots or planters have limited opportunity to thrive and fully mature.

- a. Pots or planters are free standing containers with an exposed soil surface area of less than sixty-four (64) square feet.
- b. Only the exposed soil surface area applies toward designated crown coverage allowances.
- c. Saucers in combination with other drainage devices that prevent drainage onto adjacent areas are required.

##### 3. Plantings Above Structure

Plantings above structure (such as green roofs, parking garages, decks and plazas) have limited opportunity to thrive and fully mature.

- a. Crown coverage allowance (CCA) credit shall be fifty (50) percent of the designated allowance.

## II. Landscape Plan Preparation

### Crown Coverage

#### A. Requirements (continued)

##### 4. Shrubs

Shrub plantings shall attain a mature size greater than two (2) feet in height to apply toward crown coverage allowances.

- a. Crown coverage allowance shall be two (2) square feet per individual plant.
- b. Shrub plantings shall not exceed twenty-five (25) percent of total crown coverage allowance requirement.
- c. Shrub plantings used as screening (such as related to parking areas, transformers, service areas, visual buffers, etc.) do not apply toward crown coverage allowances.

##### 5. Groundcovers, Perennials, & Turfgrass

- a. Groundcovers, perennial plantings and turf grass do not apply toward crown coverage allowances.

##### 6. Bioretention Planting

- a. Plantings and topographic transitions surrounding site drainage, detention, and sedimentation or treatment areas shall be integrated as a harmonious and consistent component of surrounding landscape.
- b. Plantings shall minimize the visual impact of hardened or armored edge treatments, headwalls, pipe outfalls, bulkheads and drainage structures.
- c. Up to twenty-five (25) percent of total crown coverage allowance may be obtained from use of approved bioretention plantings at the discretion of the City Arborist, Directors of Planning & Zoning, Recreation, Parks & Cultural Activities and Transportation & Environmental Services.

## II. Landscape Plan Preparation

### Indigenous, and Invasive Plants

#### A. Indigenous Plantings

Specification and use of a mixture of indigenous/native seasonally variable, evergreen and deciduous shrubs, ornamental and shade trees, groundcovers and perennials that reduce necessity for application of chemical fertilizers, pesticides and potable water is strongly encouraged. Indigenous plantings include species that are horticulturally acclimatized to the Mid-Atlantic and Washington, DC National Capital Region, and do not typically require special establishment periods or life-cycle maintenance.

#### B. Invasive Species

Invasive and alien species include those known to overtake natural areas, are difficult to manage and aggressively out compete indigenous/native species for water, nutrients and sunlight.

Selected examples of invasive species include:

<u>Botanical Name</u>	<u>Common Name</u>	<u>Notes</u>
<i>Ailanthus altissima</i>	Tree of Heaven	deciduous tree (female)
<i>Bambusa Sp.</i>	Bamboo Sp.	Spreading grass
<i>Celastrus orbiculatus</i>	Oriental Bittersweet	climbing vine
<i>Euonymus fortunei</i>	Climbing Euonymus	climbing vine
<i>Hedera helix</i>	English Ivy	climbing vine
<i>Lonicera Sp.</i>	Honeysuckle	climbing vine
<i>Polygonum perfoliatum</i>	Mile-A-Minute	climbing vine
<i>Pueraria labata</i>	Kudzu	climbing vine
<i>Rosa multiflora</i>	Multiflora Rose	shrub

#### C. Advisory List and References

Species appearing on the following continuously updated advisory lists are strongly discouraged from use.

1. Invasive/Alien Species Advisory List;  
Commonwealth of Virginia, Department of Conservation and Recreation.
  - a. Reference <http://www.state.va.us/dnh/>
2. Advisory Bulletins on Invasive Species;  
Virginia Native Plant Society.
  - a. Reference <http://www.vnps.org>

## II. Landscape Plan Preparation

### Recommended Planting Installation Seasons

A. Recommended seasons are a general guide based on historical climatic data and typical performance of plantings, and which vary dependent on project-specific environmental conditions. 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 shall be reviewed on an individual project basis.

#### 1. Trees

- a. Do not install/plant the following trees between September 15 and March 15.
  1. Oaks (*Quercus Sp.*, Such as *Q. rubra*, *Q. alba*, *Q. phellos*, *Q. coccinnea*).
  2. Dogwood (*Cornus Sp.*)
  3. Sweetgum (*Liquidambar Sp.*)
  4. All Conifers and Evergreens except White Pine (*Pinus strobus Sp.*).

#### 2. Deciduous and Evergreen Plants

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

#### 3. Perennials

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

#### 4. Spring Flowering Bulbs

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

#### 5. Seasonal Annuals

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

#### 6. Turf Grass

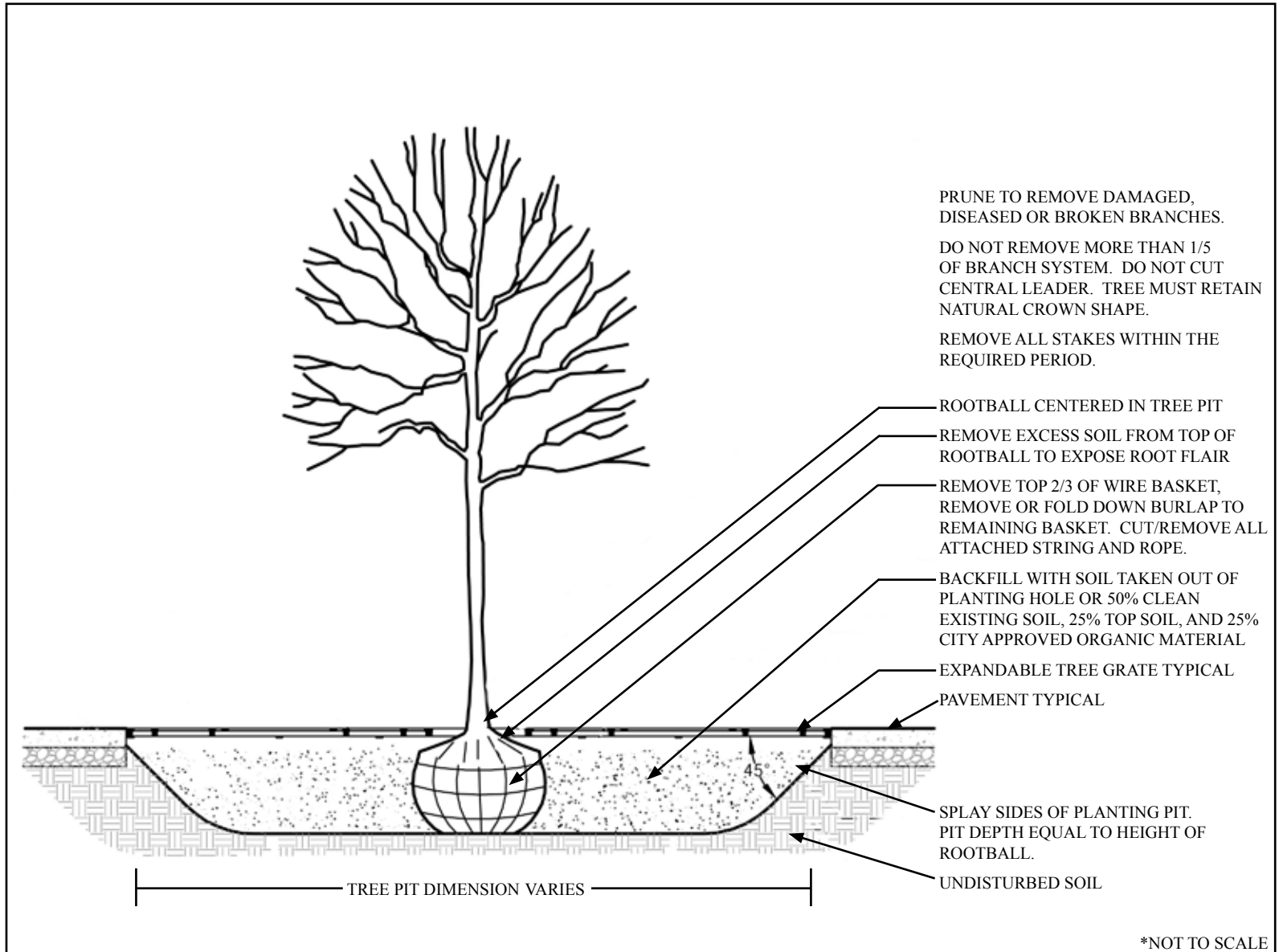
- a. Install/plant between March 15 and May 15 and/or September 15 and October 15.
- b. Do not install/plant seed or sod turf grass areas when ambient air temperature is below forty (40) degrees Fahrenheit, or is forecast for a twelve (12) hour period after completion of work.

#### 7. No Plant Installation

- a. Do not install plantings or turf grass between June 15 and September 15, without prior written approval by the City Arborist.

## II. Landscape Plan Preparation

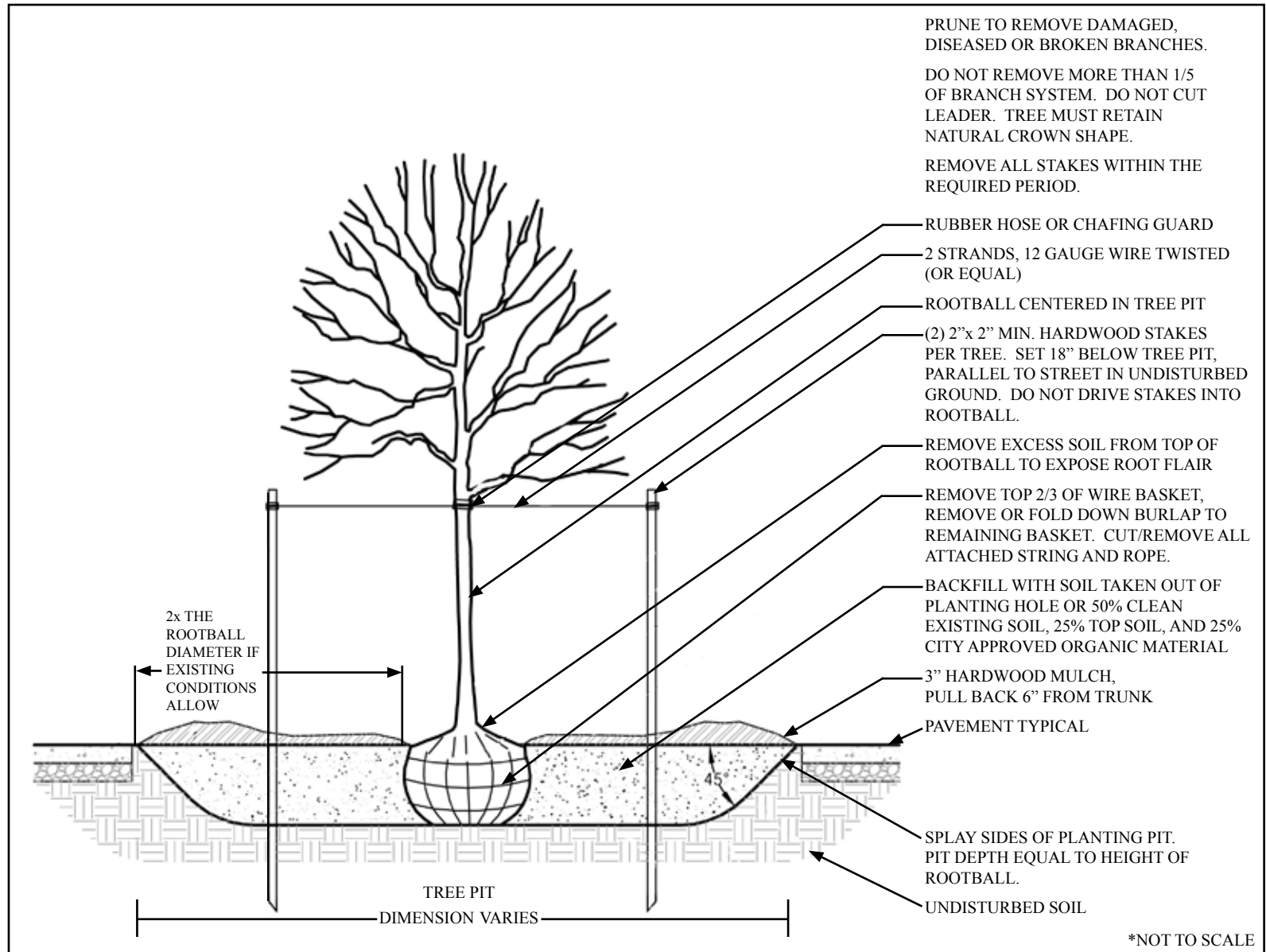
Figure II-A. Tree Grate



TREE PLANTING WITH TREE GRATE

## II. Landscape Plan Preparation

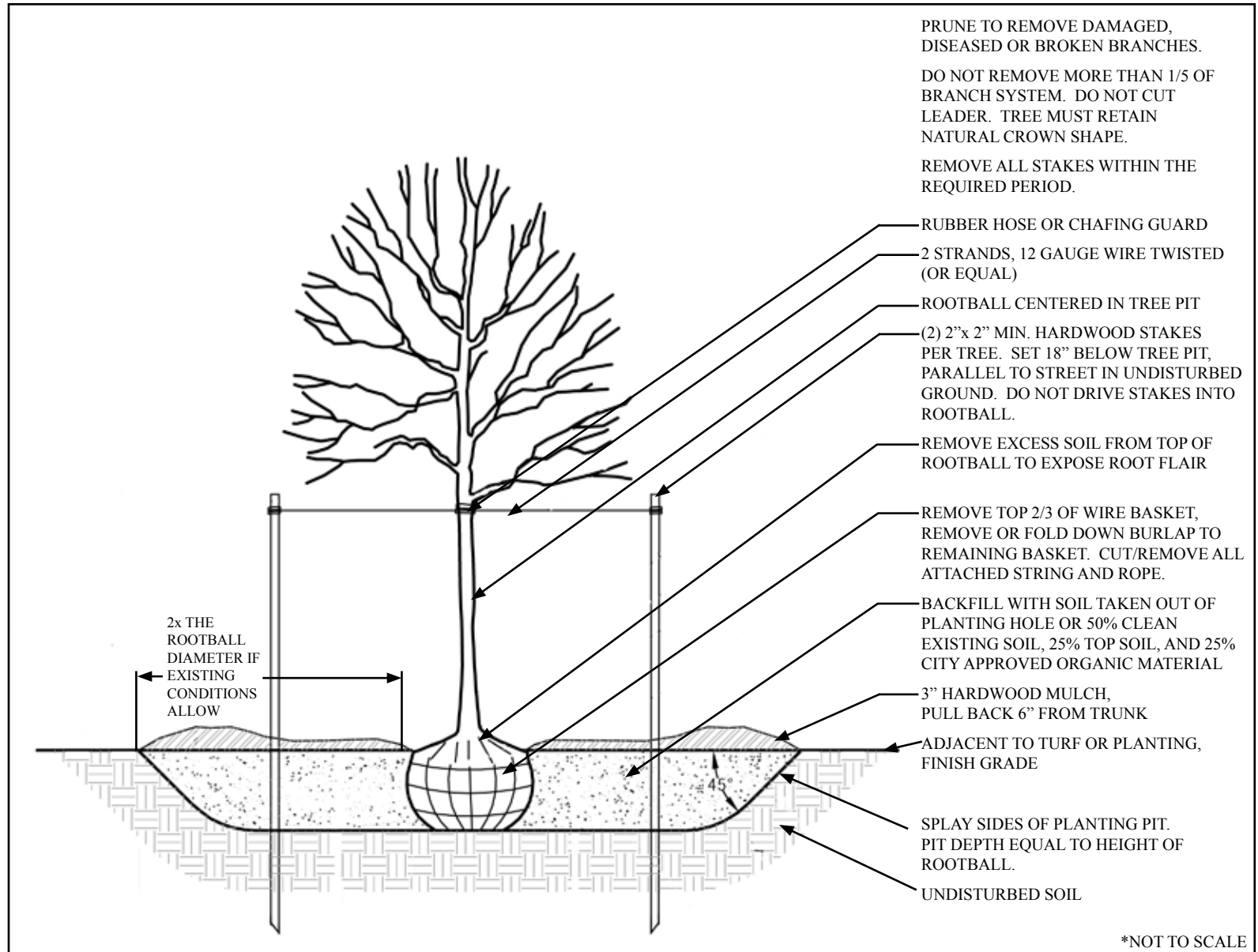
Figure II-B. Tree Well



TREE PLANTING IN R.O.W. ADJACENT TO PAVEMENT

## II. Landscape Plan Preparation

Figure II-C. Planting Strip



TREE PLANTING IN TURF OR PLANTED AREA



### III. Execution and Maintenance

#### Project Coordination and Installation

##### A. Coordination with Site Utilities and Signs

1. Execution and installation of the landscape plan shall not be compromised by variations from the approved location of site utilities and service connections including:
  - a. Water, sanitary and storm sewer, electric, gas, cable television lines.
  - b. Transformers, cable television and telephone boxes, air conditioning/heating units.
  - c. Street lights, pedestrian lights and related service conduit, ballast/splice boxes.
  - d. Traffic signs and signals.
  - e. Site-use related signs or signature elements.
  - f. Fire department connections, information stations, fire access ways or emergency vehicle access.

##### B. Plantings Above Structure

1. Plantings above structure include all areas such as green roofs, parking garages, decks and plazas.
2. Minimum Depth Requirements  
Vertical depth is the measurement between finish grade of planting media and top of highest related building structure elevation (such as top of floor elevation at bottom of planted area).
  - a. Trees Three hundred (300) cubic feet per tree; four (4) feet minimum depth and five (5) feet maximum continuous vertical depth of planting media.
  - b. Shrubs and groundcover Four (4) feet of continuous vertical depth of planting media.
  - c. Turf Areas Three (3) feet of continuous vertical depth of planting media.
3. Irrigation  
All planting areas above structure shall have a landscape irrigation/water management system in accordance with Section I-D.

### III. Execution and Maintenance

#### As-Built Landscape and Irrigation Documents

##### A. Requirements

As-built documents for all landscape and irrigation installations is required.

##### B. Scope of Work

Drawings shall at a minimum indicate the following:

1. As-constructed site conditions including clear delineation of all variation(s) and changes from approved drawings including location, quantity and specification of all project elements.
  - a. As-constructed site conditions inventory shall be dated consistent with inspection.
  
2. Landscape Drawings
  - a. Pre-existing site conditions, including vegetation to be preserved, and other site features that remain.
  - b. As-constructed conditions that identify and record the species, quantity and location of plantings.
  - c. Updated Planting Schedule or Index indicating species, specifications and quantities.
  - d. Updated crown coverage calculations including required crown coverage, approved coverage and any changes due to as-constructed conditions.
  - e. Inventory of dead, dying, or missing plantings.
  - f. Schedule for replacement of plantings.
  - g. As-built drawings shall be prepared, dated and sealed by a Landscape Architect certified to practice in the Commonwealth of Virginia.

### III. Execution and Maintenance

#### As-Built Landscape and Irrigation Documents

##### B. Scope of Work (continued)

Drawings shall at a minimum indicate the following:

3. Certification of Tree Wells, Tree Trenches and Plantings Above Structure
  - a. A certification letter is required for tree wells, tree trenches, and plantings above structure.
    1. The letter shall certify that all above and below grade construction is in compliance with approved drawings and specifications.
    2. The letter shall be submitted by the owner/applicant/successor and sealed and dated as approved by the project's Landscape Architect.
    3. The letter shall be submitted to the City Arborist and accepted prior to approval of the last and final Certificate of Occupancy for the project.
4. Landscape Irrigation and Water Management Drawings
  - a. As-constructed conditions that clearly identify and record the location, dimension and specification of all system component including heads, pipes, valves, controller(s), sleeves, backflow preventer(s) and water source.
  - b. As-built documents shall be prepared, dated and sealed by an Irrigator with Class certification commensurate with the subject project type in the Commonwealth of Virginia.

### III. Execution and Maintenance

#### Maintenance

##### A. Purpose

The intent of landscape maintenance is to perpetually guide ongoing stewardship of existing/retained and newly installed plantings associated with site disturbing activities.

1. For designed or domesticated landscapes, maintenance shall be performed in a manner that retains the intent of the original/approved planting and site design.
2. For naturally occurring landscapes, maintenance shall be performed in a manner that retains the site's natural character, visual and environmental quality.
3. Substitutions, variations/changes or departures from approved planting and site design are not permitted without written authorization by the City of Alexandria.

##### B. Scope of Work

Furnish all materials, labor and equipment required to complete work including:

1. Removal of installation materials (guy wires, stakes, flagging after required period).
2. Removal and replacement of dead, dying or severely damaged plantings.
3. Mowing, aeration, seeding and replacement of turf grass.
4. Edging of lawn and planting areas.
5. Pruning of trees, shrubs, and groundcovers for horticultural and/or security/safety purposes.
6. Fertilization.
7. Installation of mulch in planting beds and around trees.
8. Restoration of planting saucers and bed lines.
9. Policing of grounds, pedestrian and travel ways and adjacent public right of way to remove fallen leaves/plant debris, invasive plants and litter.
10. Watering and irrigation/water management system maintenance.

### III. Execution and Maintenance

#### Maintenance

##### C. Requirements

All plantings shall be consistently maintained in a flourishing and vigorous growing condition by the applicant, owner, or successor(s) of the property.

1. Dead, or fatally damaged planting materials do not show vigorous, hardy and sustained growth characteristics on seventy-five (75) percent of the specimen.
  - a. 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.
2. Prune plantings to minimize interference with adjacent conditions.
  - a. As plantings mature, ensure that tree branching clearance heights are elevated to seven (7) vertical feet from adjacent finish grade. Minimize interference in areas including:
    1. Adjacent to sidewalks/pedestrian areas and other paved areas.
    2. Adjacent to vehicular traffic travelways.
    3. Adjacent to site lighting, signs, building entrances, building service areas, structures or other site conditions as deemed necessary.
3. Prune groundcover to retain its natural growing habit within planting beds or borders.
  - a. Restrict groundcover from invading or overcoming adjacent plants.

##### D. Performance and Maintenance Bonds

1. Bond amounts are based on criteria established by the City as available through the Department of Transportation and Environmental Services.
2. Landscape and Performance and Maintenance Bonds shall be reviewed for reduction as a component of the Certificate of Occupancy process.

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Staff:

Recreation, Parks & Cultural Activities

Planning & Zoning

Transportation & Environmental Services

Code Enforcement

Office of Historic Alexandria

Technical Layout and Design

