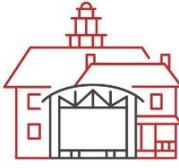


TREE PRESERVATION & PLANTING GUIDE



TOWN OF
VIENNA
since 1890

This guide is intended to help applicants comply with the code sections related to trees and development in the Town of Vienna, Virginia (the Town). The guide does not replace the Town code; applicants should refer to the code in addition to this guide to successfully prepare Urban Forestry-related components of a site plan.

The Town adopted a Tree Conservation code in compliance with the Code of Virginia [15.2-961.1 Conservation of Trees During Land Development Process in Localities Belonging to a Nonattainment Area for Air Quality Standards](#). The Town code shall become effective July 29, 2024.

The Vienna Tree Conservation Ordinance is contained in [Chapter 17](#) and emphasizes the preservation of existing tree canopy and sets a tree conservation target based on the extent of the pre-development tree canopy. Where it is not feasible to preserve the existing canopy to the minimum percentage required, new trees shall be installed to meet the required percentages.

The tree ordinance is generally enforced by the Town Arborist, however this guide refers to the “Director of DPR (Department of Parks and Recreation) and/or their designated staff” which includes the Urban Forester, Town Arborist or other Town Staff. The final approval body for all site plans is the Director of Planning and Zoning.



Established: 2021

Last Review: February 2026

Next Review: 2028 or earlier if relevant code changes

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I. Canopy Coverage Requirements

Background

The development of an undeveloped tract; the redevelopment of any existing tract by removal of any structure and replacement with a new structure, or the addition to an existing structure or dwelling, that results in an area of disturbed soil of 2,500 or more square feet, shall provide for the preservation or replacement of trees on the development site such that, after twenty (20) years after development, minimum tree canopy coverages meet the percentages corresponding to the associated zone or district as outlined in Figure 1. ([§17-2001\(a\)&\(b\)](#))

<i>Zone or District</i>	<i>Percentage of Site to be Covered by Tree Canopy in 20 Years</i>
<i>RS-16 – Residential Single Unit Detached</i>	<i>Twenty five percent (25%)</i>
<i>RS-12.5 – Residential Single Unit Detached</i>	<i>Twenty five percent (25%)</i>
<i>RS-10 – Residential Single Unit Family Detached</i>	<i>Twenty percent (20%)</i>
<i>RMU – Residential Multi-Unit</i>	<i>Fifteen percent (15%)</i>
<i>T – Transitional</i>	<i>Ten percent (10%)</i>
<i>AC - Avenue Center District</i>	
<i>AE – Avenue East Gateway District</i>	
<i>AW – Avenue West Gateway District</i>	
<i>CS – Church Street District</i>	
<i>GS – Gateway South District</i>	
<i>CP – Corporate Park District</i>	
<i>M – Mill District</i>	
<i>NM – Neighborhood Mixed-Use Zone</i>	

Figure 1. Required Canopy Coverage Percentages

The tree canopy requirements set forth in Figure 1 may be met through the preservation or planting of trees. However, when existing trees meet standards of health, condition, and suitability, and when it is feasible to preserve those trees within the framework of permissible uses, densities, design standards, and construction practices, all efforts shall first be made to meet the tree canopy requirement through the preservation of trees before tree planting is allowed to meet any portion of the tree canopy requirement. ([§17-2002\(a\)](#))

The percentage of the development site covered by tree canopy at the time of plan submission shall equate to the minimum portion of the total 20-year tree canopy requirement of [§17-2001\(b\)](#) that should be met through tree preservation. This minimum portion shall be identified in plats and plans as the “tree preservation target” and shall be included in site plan calculations or narratives demonstrating how the overall requirements set forth in [§17-2001](#) and [§17-2002](#) have been met. ([§17-2003](#))

Deviations, in whole or part, from the tree preservation target may be requested under the following conditions([§17-2004\(a\)](#)):

1. Meeting the tree preservation target would prevent the development of uses or densities otherwise allowed by the [Town Zoning Ordinance](#).
2. Meeting the tree preservation target would require the preservation of trees and forested areas that do not meet standards for health, structural condition, and other vegetation and risk management requirements.

3. Construction activities could be reasonably expected to impact existing trees or forested areas used to meet the tree preservation target to the extent they would not likely survive in a healthy and structurally sound manner for a minimum of twenty (20) years in accordance with the post-development standards for trees and forested areas.

Deviations from the Tree Preservation Target

Deviations shall be granted for any of the justifications listed above provided that a written request is submitted and approved by the Director of Planning and Zoning (or their designee) in consultation with the Director of Parks and Recreation (or their designee). ([§17-2004\(d\)](#))

Per [Virginia Code § 15.2-961.1.E.3](#):

If, in the opinion of the applicant, the project cannot meet the tree preservation target due to the conditions described in 1, 2, or 3, the applicant may request a deviation from the preservation requirement. In the request for deviation, the applicant shall provide a letter to the locality that provides justification for the deviation, describes how the deviation is the minimum necessary to afford relief, and describes how the requirements for canopy coverage will be met through tree planting or a tree canopy bank or fund established by the locality. Proposed deviations shall be reviewed by the locality's urban forester, arborist, or equivalent in consultation with the locality's land development or licensed professional civil engineering review staff. The locality may propose an alternative site design based upon adopted land development practices and sound vegetation management practices that take into account the relationship between the cost of conservation and the benefits of the trees to be preserved as described in ANSI A300 (Part 5) — 2005 Management: Tree, Shrub, and Other Woody Plant Maintenance — Standard Practices, Management of Trees and Shrubs During Site Planning, Site Development, and Construction, Annex A, A-1.5, Cost Benefits Analysis (or the latest version of this standard). The applicant shall consider the alternative and redesign the plan accordingly or elect to satisfy the unmet portion of the preservation threshold through on-site tree planting or off-site planting mechanisms, so long as the applicant provides the locality with an explanation of why the alternative design recommendations were rejected. Letters of explanation from the applicant shall be prepared and certified by a licensed professional engineer as defined in § 54.1-400. If arboricultural issues are part of the explanation, then the letter shall be signed by a Certified Arborist who has taken and passed the certification examination sponsored by the International Society of Arboriculture and who maintains a valid certification status or by a Registered Consulting Arborist as designated by the American Society of Consulting Arborists. If arboricultural issues are the sole subject of the letter of explanation, then certification by a licensed professional engineer shall not be required.

Understanding if Your Project Requires Compliance with The Code

If your project meets or exceeds 2,500 square feet of land disturbance then a Tree Preservation and Protection Plan is required.

Within this framework there may be special considerations for your project based on the size of the site in relation to the area of development, subdivision of the lot for development, recent development projects on the site and protracted permitting and review associated with the proposed or active project.

- For development projects on large sites where the development footprint is relatively small to the entire site a variation in the inventory requirements might require that only trees whose CRZ is within or intersects the LOD be inventoried, however total site canopy calculations will still be required to show compliance with the zone based canopy coverage requirements. If other non-project associated trees are removed from the site during the project planning or construction phases those changes must be reflected in the site plan revisions. Failure to amend canopy coverage calculations for non-project associated tree removals may delay the project close-out process until site wide canopy coverage analysis is corrected.
- For new subdivisions the application requires a single tree preservation and planting plan for all lots created. If future development plans for the subdivided lots deviate from their previously proposed or approved development footprint(s), a re-assessment of the tree canopy and preservation plan may be required for either individual sites or the subdivision as a whole depending on the scope of the proposed changes.
- On sites where a Large-Scale Residential Project, Major Site Plan, or other project requiring canopy coverage compliance has been recently completed and a new project over 2,500 sq ft of disturbance is proposed on the same site, the prior approved canopy calculations, tree preservation and planting plans may serve as the base tree preservation plan for the new project, with any field revisions or substitutions to the previously approved project's tree preservation and planting plans, or landscape modifications since close out of the previous project reflected in the new submission. Total canopy area awarded to newly planted trees in the previously completed project shall be applied to those same trees in the new proposed plan.
- If a project has been in the review process or under construction for a protracted period of time, generally greater than 2 years, or has changed project management or ownership during the course of a protracted development process the Town may request a re-assessment of the trees on site be provided to ensure proposed preservation trees still qualify for canopy credit. This is generally done if during site visits the Director of DPR and/or their designated staff observe multiple tree issues. This

is done as a proactive measure to help applicants continue their projects and prepare for occupancy or project close-out.

- If a project has been accepted for review or is actively under construction in accordance with the previously approved plan, and the tree conservation ordinance changes, the project must only comply with the version of the code under which the project was started. Applicants may at their own discretion choose to comply with the updated tree preservation requirements.

In any of the above types of scenarios further guidance should be sought from the Department of Planning and Zoning and the Department of Parks and Recreation.

Canopy Coverage Calculation

The Town provides a canopy coverage analysis worksheet which contains all of the necessary information and calculations for executing the canopy coverage analysis as it applies to most standard development projects. Applicants are not required to use the Town provided worksheet but are strongly encouraged to do so. Please contact the Director of DPR and/or their designated staff with any questions about the Canopy Coverage worksheet. The following information shall be included in all tree canopy coverage worksheets

1. Lot area in square feet.
2. Existing, pre-development, canopy coverage. (Provided by tree inventory)
3. The minimum tree canopy coverage percentage required based on the proposed, if different from the initial, zoning of the parcel under development. See Figure 1.
4. Minimum tree canopy coverage required in square feet.
5. The “Tree Preservation Target” which is defined as the percentage of the site covered by tree canopy at the time of plan submission which equates to the minimum portion of the required canopy coverage percentage, by zoning, as identified as shown in Figure 1, that shall be provided through tree preservation.
6. Tree canopy coverage that will be provided from tree preservation. See section [Canopy Coverage from Tree Preservation](#) for details on how to count trees for preservation.
7. Tree canopy area that will be met with newly planted trees. See section [Canopy Coverage from Tree Installation](#) for details on counting canopy from tree installation.
8. Total post development twenty (20) year projected canopy.

Tree Inventory

1. **A tree inventory shall be performed by a Qualified Arborist who is either an [International Society of Arboriculture \(ISA\) Certified Arborist](#) or a Registered Consulting Arborist as designated by the [American Society of Consulting Arborists](#). Show, on the plan, the ISA Certified Arborist number or RCA number.**
 - a. If there are no trees on the development site, and no off-site or ROW trees will be impacted (CRZ disturbance), then a statement from the site surveyor or engineer affirming that no existing trees will be impacted may be provided in lieu of a tree inventory and tree preservation plan from a qualified arborist. Canopy coverage calculations and a planting plan to demonstrate how the site will achieve its required twenty (20) year canopy coverage target is still required.

2. Note the requirements for **Restricted Trees** as they relate to the inventory and canopy coverage calculations.

3. Inventory all trees with the following characteristics:
 - a. Deciduous trees greater than four (4) inches in diameter measured at breast height (DBH).
 - i. Diameter at breast height (DBH) measured at fifty-four (54) inches from grade or the industry-accepted standards for deviation from fifty-four (54) inches.
 - b. Evergreen trees greater than six (6) feet in height regardless of DBH.
 - c. Multi-stemmed trees, which split below DBH, greater than eight (8) feet tall even if the individual stems may be less than 4" DBH. Use the sum of squares method, as follows, to calculate the "DBH".
 - i. Measure the DBH of each trunk. The DBH for the tree is found by taking the square root of the sum of all squared stem DBHs rounding to the nearest whole number.
Example: You have three stems that measure 5", 6" and 8" the DBH is calculated as follows: $\sqrt{(5^2+6^2+8^2)} = \sqrt{(25+36+64)} = \sqrt{125} = 11"$
 - ii. Multi stem trees shall be designated as such in a separate column in the inventory.
 - iii. Critical Root Zone measurements for multistem trees shall be two (2) feet radius per one (1) inch of diameter.
 - d. Any deciduous tree less than four (4) inches DBH, or evergreen less than six (6) feet tall, which is self-supporting and healthy woody plant material exceeding five (5) feet in height that is being included in any canopy coverage calculation must be included in the inventory.

4. Inventoried trees shall identify the following attributes regarding location and ownership: See **Figure 2** for a visual guide on determining tree ownership as it relates to the qualification of trees for canopy credit under the [Town Code Section 17](#).

- a. **Onsite:** Evergreen and deciduous trees whose trunks are fully within the property boundaries. All on site trees must be inventoried and assessed regardless of whether their CRZ will be impacted by development.
- b. **Offsite:** Evergreen and deciduous trees whose trunk at the natural pre-development grade are located on lots other than the one under development. Any offsite tree meeting the criteria in point three (3) of this section whose CRZ intersects the limits of disturbance (LOD) must be inventoried. Neighboring property owner permission is required to evaluate offsite trees on the neighboring property.
 - i. In lieu of permission to enter neighboring property, trees shall be evaluated from the public right of way or property under development and a note added to the inventory to reflect any caveats with evaluating offsite trees.
- c. **Joint, shared, or co-owned:** Evergreen and deciduous trees whose trunk at the natural pre-development grade crosses, by any measurable amount, the boundary of two or more separate properties. See [Figure 2](#).
 - i. These trees do not qualify for any existing **or** additional canopy credit.
 - ii. These trees must be included in the tree inventory, however their canopy area **shall not** be included in total existing canopy calculations, or any canopy calculations as they pertain to the tree preservation target, multipliers, or canopy preserved for credit.
- d. **ROW (Right of Way) and Town-Owned** trees are those located in the Town right of way or town property directly adjacent to the development site.
 - i. ROW trees located between the development site and adjacent streets (in planting strips) greater than one (1) inch in diameter (DBH) must be inventoried and shown on the plan regardless of whether they are being impacted by development (CRZ impact).
 - ii. If ROW trees are less than one (1) inch in diameter (DBH), as an alternative to inventorying these trees, a narrative may be submitted with the inventory and hatching, or points shown on the plan indicating the approximate area where the trees are located (surveyed points not required). Staff will work with applicants to determine preservation requirements in these circumstances.
 - iii. Trees that are on Town Property (e.g. parks) adjacent to development sites shall be subject to the same standards as ROW trees, except that they must only be inventoried if they are greater than one (1) inch in diameter and their CRZ intersects the LOD.
 - iv. If ROW trees are requested to be removed for development activities they will be bonded at the expense of the applicant, in coordination with the Director of DPR and/or their designated staff. The Director of DPR and/or their designated staff will make determinations regarding replacement quantities, species and location if post development conditions warrant replacement.
 - v. Trees that are joint/shared/co-owned in the ROW or Town Property will not require replacement if removed.

- vi. If circumstances regarding ROW and Town-Owned trees do not clearly fall within the criteria established in this section, applicants should consult the Director of DPR and/or their designated staff for further guidance.

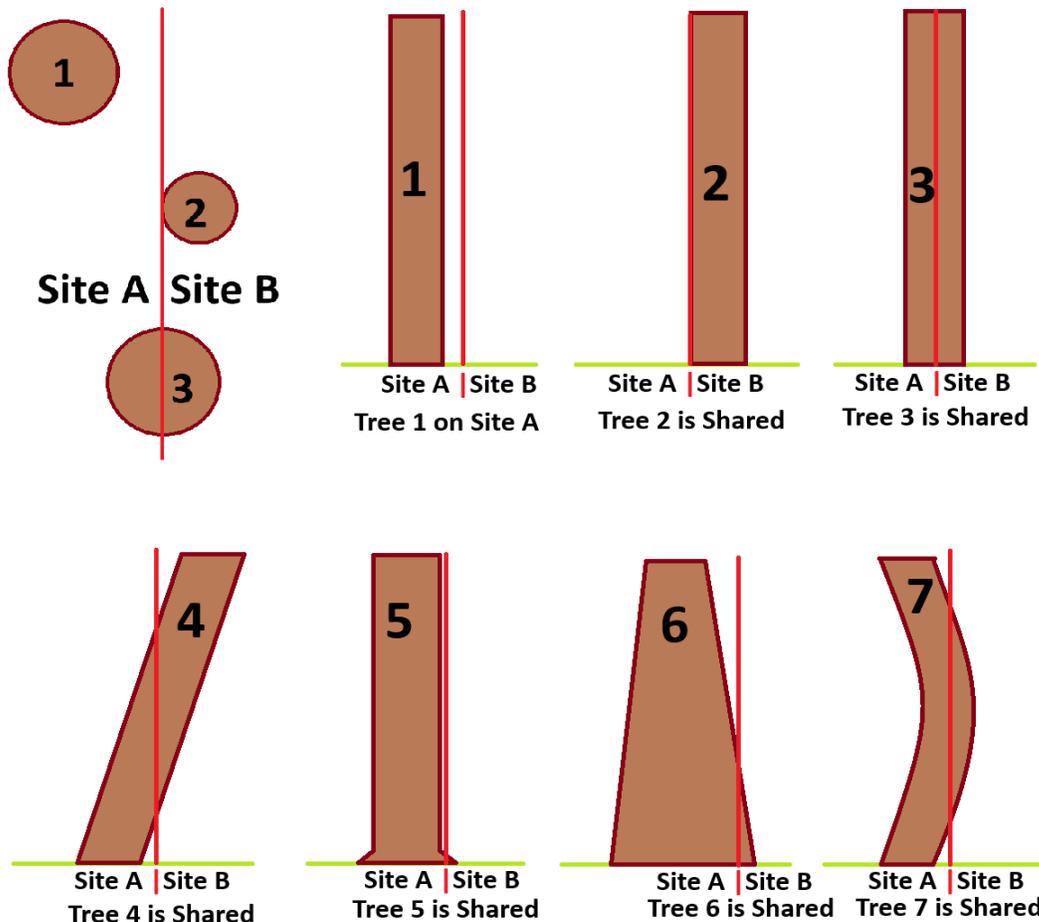


Figure 2 Graphic showing generalized tree trunk forms (numbered brown shapes) and how their placement near or on property lines (red line) effects ownership status between sites A & B as it relates to qualification for canopy coverage.

5. All trees on the inventory must be numerically tagged in the field to correspond with the inventory. A stamped metal tag or ribbon with the tree number written on the surface will suffice. *Please note it is advisable to remove all tags/ribbons from trees once the project is complete, after the certificate of occupancy has been approved.*
- For trees tagged with numbered aluminum tags, nails should maintain a minimum ~ one half (1/2) inch of space between the head of the nail and the trunk of the tree to allow for unimpeded tree growth through the development process and removal of the tag post-project completion.
 - Trees that would be significantly damaged by nails should be identified with numbered flagging and that detail noted in the tree inventory table.
 - Offsite trees shall not be tagged without owner permission and do not need to be tagged.
 - Town ROW trees shall not be tagged but may be flagged.

6. The tree inventory shall contain the following information for each qualifying tree:
(A tree inventory template is available from the Town website that contains all necessary fields)
- a. List the tree by number, corresponding with the tree's geographic location on the site plan.
 - b. Botanical name.
 - c. Common name.
 - d. Diameter at breast height (DBH)
 - e. The calculated critical root zone (CRZ) value of each tree. The CRZ shall be measured at one and one half (1.5) feet of radius per one (1) inch of DBH.
 - i. **The CRZ for multi-stem trees shall be measured at 2.0 feet per one (1) inch DBH (See sum of squares method 3.c).**
 - f. Indication of tree(s) being multi-stemmed, splitting below DBH, and therefore subject to the sum of squares measurement method and modified CRZ.
 - g. Pre-development condition (qualitative) – dead, poor, fair, good, or excellent, OR numeric (quantitative) scale (0-100 or 0.00-1.00) with key to match with qualitative assessment. See [Appendix](#).
 - h. Life expectancy of the tree as less than or greater than twenty (20) years.
 - i. Ownership/Location of trees: onsite, offsite, joint/shared/co-owned, ROW.
 - j. Whether the tree will be removed or retained.
 - k. Notes or comments on defects, pests, disease, vines, or other situationally relevant observations relating to individual trees (e.g. hardware mounted to trees, ingrown posts, pre-existing damage, etc.).

Canopy Coverage from Tree Preservation

1. For trees to qualify for preservation credit they must meet the following criteria:
 - a. Trees whose trunks are fully within the boundaries of the parcel under development.
 - b. Trees which are in "fair" condition or (50 or .50 or 50%) or better. See [Appendix](#).
 - c. Are not significantly impacted by construction (CRZ impact is less than 30%).
 - d. Are not species deemed invasive or otherwise susceptible to pests and disease as found in the Restricted Trees List. See [Restricted Trees](#) for more information.
 - e. Trees which have been assessed as meeting or exceeding a twenty (20) year projected life expectancy.
 - f. Vines must be controlled if present on existing trees. See Section on [Invasive Species and Vines](#) for more information.
2. Trees with any of the following conditions may **not** be used for canopy coverage credit:
 - a. When more than 30% of the respective tree's critical root zone will be impacted by construction activities, including but not limited to trenching, grading, digging, cutting, or filling of soil, etc.

- i. In certain circumstances based on species profile, tree health and types of protection measures applied, a variance to this standard may be granted by the Director of DPR and/or their designated staff for conditional canopy credit.
 - b. Trees determined by the applicant's qualified arborist or the Director of DPR and/or their designated staff to be in "poor" condition or less than (50 or .50 or 50%). See [Appendix](#).
 - c. Trees retained in violation of the [Tree Protection, Removal and Pruning](#) standards.
 - d. Trees on the [Restricted Trees](#) List.
- 3. Conditional credit may be awarded for species which have generally documented health and/or structural issues, such as certain *Acer* and generally *Salix* species if trees are in good health and not located near structures where significant damage could be sustained if tree failure occurs. Details about applicable trees may be found in the Restricted Trees List, see [Restricted Trees](#) for more information.
- 4. Shared trees do not qualify for any canopy credit per [§17-2005.\(c\)](#).
 - a. See [Figure 2](#) for a visual guide on determining tree ownership as it relates to the qualification of trees for canopy credit under the [Town Code Section 17](#).
- 5. Trees that meet the criteria for preservation may qualify for an additional 25% canopy coverage multiplier per [Virginia Code 15.2.961.1\(I\)1](#).
- 6. If utility work (installation, removal, modification, replacement, etc.) affects preserved trees or tree preservation areas, affected trees must be assessed for impacts which may result in a reduction or disqualification of the affected trees canopy credit. Using less invasive methods like boring or air spade excavation can help preserve tree roots, allowing the trees to still qualify for credit. Contact the Director of DPR and/or their designated staff before starting such utility work for more details.
 - a. In the event of utility impacts to preserved trees it will be the responsibility of the applicant to provide revised tree canopy calculations and a revised planting schedule to cover any canopy deficiencies.
- 7. If trees from the development site are transplanted off site for storage and replanted on the development site contact the Director of DPR and/or their designated staff for direction on how to account for these trees in canopy coverage calculations.

Restricted Trees

Restricted trees are those species which cause negative impacts to native plant communities, are prone to severe pest and disease issues or possess inherent physiological traits that predispose them to structural failure. See the Restricted Trees List in the [Appendix](#).

These trees may qualify for conditional credit in certain circumstances which have been described in the worksheet or otherwise cannot be counted for canopy credit if no conditional qualifying criteria are stated.

Unless they meet the criteria for conditional canopy credit the canopy of these trees shall not be included in total existing canopy calculations, or any canopy calculations as they pertain to the tree preservation target, multipliers, or canopy preserved for credit.

Restricted trees must be inventoried if they are within the boundary of the development site, are shared trees or are offsite trees whose CRZ intersects the LOD that meet the inventory requirements stated in this guide.

Tree Preservation Plan Requirements

All tree preservation, removal and plantings shall be executed as shown on the approved plan. Failure to do so may require re-analysis of the canopy coverage calculations and re-submission of a revised plan for formal review. It is the responsibility of the applicant to ensure that preservation, removals and plantings in their plan conform to desired finished conditions before the start of the project. Furthermore, it is also the responsibility of the applicant to ensure that all contractors and subcontractors understand and adhere to the approved plan and the tree preservation and plantings standards described in this guide.

1. In addition to the information provided in the tree inventory table include the following:
 - a. For each tree being preserved for canopy credit note the canopy area in square feet (sf). If multiple trees canopies are coalesced, then indicate the total canopy area across multiple trees in one cell and in the notes section indicate which trees are being claimed for credit.
 - b. For any tree being retained or preservation credit, note the tree preservation measures.
 - i. Trees may be retained without preservation credits if they cannot qualify for canopy credit. The condition of retained trees should not present an elevated risk condition post construction and should only be done for trees likely to survive construction.
 - ii. The Town may provide notice for trees having been evaluated as presenting an elevated or hazardous condition to life or property.
2. The tree preservation plan shall illustrate the following elements at scale on the plan:
 - a. Graphic and written scale, graphic legend, and North arrow.
 - b. The existing site features, property boundaries, sidewalks, curb and gutter, proposed site features, land disturbing activities including existing and proposed grades, the limits of disturbance, all existing and proposed overhead and underground utilities, etc.
 - i. Applicants shall provide information, by way of a note on the tree preservation plan, if there are unknown locations for new utilities. Any underground utility installation

that impacts the tree preservation area. may require a revised tree preservation plan and/or mitigation plan.

- c. All trees listed in the inventory with corresponding alpha-numeric labels.
- d. Indicate the trees being removed with a bold “X” through the tree location and/or label.
- e. The critical root zone (CRZ) for each tree. The CRZ shall be measured at one and one half (1.5) feet of radius per one (1) inch of DBH.
 - i. The CRZ for multi-stem trees shall be measured at two (2) feet per one (1) inch of DBH as derived from the sum of squares method (See [3.c](#))
- f. The boundaries of tree canopies (drip line) shall be depicted as accurately as possible to reflect real world conditions. (Generic symbology is unacceptable)
- g. For all trees retained, depict and annotate the tree preservation measures that will be employed throughout the project to protect trees from construction damage. Some examples of tree preservation measures that can be utilized are:
 - i. Protection Fence, including trenchless silt fence.
 - ii. Root protection pads/mats.
 - iii. Wood chip or other mulch application.
 - iv. Root pruning.
 - v. Areas of demolition by hand or manual tools.
 - vi. Removal of vines on or around the tree trunk and in the tree canopy.
 - vii. Invasive, non-native plant removal in the vicinity of the tree.
 - viii. Insect and/or disease control or treatment.
 - ix. Supplemental watering method.
 - x. Soil testing and amendment/remediation or aeration/excavation

Canopy Coverage from Tree Installation

If new trees will be installed to meet the minimum tree canopy coverage requirements or if a tree shall be planted in the ROW or on Town property to replace trees previously approved for removal, then a Tree Installation Plan is required. A Tree Installation Plan, which may otherwise be known as a Landscape Plan, Planting Plan or Planting Schedule shall be created by a qualified arborist or design professional, such as a landscape architect, APLD Certified Professional Landscape Designer (CPLD), engineer etc.

Trees for canopy coverage should be selected from the Town Approved Tree List, which provides the base twenty (20) year canopy coverage area provided as well as applicable multiplier credits per species. New trees may qualify for up to two (2) multiplier credits if indicated in the Town Approved Tree List. For trees not listed on the approved tree list contact the Director of DPR and/or their designated staff. See the Town Approved Tree List in the [Appendix](#), or at the Town website: [Trees | Town of Vienna, VA](#)

Multiplier Credits for Newly Planted Trees		
“Air Quality”	Trees planted to absorb or intercept air pollutants, tree species that produce lower levels of reactive volatile organic compounds, or trees that act to reduce air pollution or greenhouse gas emissions by conserving the energy used to cool and heat buildings.	One and one-half (1.5) the area normally projected for such trees planted.
“Water Quality”	For water quality-related reforestation or afforestation projects (plantings in the RPA), and for trees planted in low-impact development and bioretention water quality facilities (SWM raingardens and planter boxes). The low-impact development practices and designs shall conform to town standards to qualify for these credits.	One and one-quarter (1.25) the area normally projected for such trees planted.
“Wildlife Benefit”	For native tree species planted to provide food, nesting, habitat and migration opportunities for wildlife. These credits may also apply to cultivars of native species if the Town determines that such a cultivar is capable of providing the same type and extent of wildlife benefit as the species it is derived from.	One and one-half (1.5) the area normally projected for such trees planted.
“Local Ecotype”	For use of native tree species that are propagated from seed or tissue collected within the mid-Atlantic region. Documentation of plant material origin at time of planting required to receive these credits	One and one-half (1.5) the area normally projected for such trees planted.
“Improved Cultivars & Varieties”	For the use of cultivars or varieties that develop desirable growth and structural patterns, resist decay organisms and the development of cavities, show high levels of resistance to disease or insect infestations, or exhibit high survival rates in harsh urban environments. This could apply to any species, not only those indicated in the Town Approved Tree List.	One and one-quarter (1.25) the area normally projected for such trees planted.

- A minimum of **TWO (2)** different tree species is **preferred** when planting 3-5 new trees.
- A minimum of **THREE (3)** different tree species is **preferred** when planting 6-9 new trees.
- A minimum of **FOUR (4)** different tree species is **preferred** when planting 10+ new trees.
- If adequate space is available in the front yard at least one (1) tree **should be considered** for planting in that area.
- Trees planted as a part of SWM and RPA requirements do count towards site canopy coverage.

Plant installation shall comply with the [Tree Planting Specifications](#) found in this guide. These installation specifications must be included with all Tree installation Plans

Tree Installation Plan Requirements

1. A table shall be provided showing:
 - a. Botanical name.
 - b. Common name.
 - i. Variety/Cultivar if applicable
 - ii. If the variety/cultivar being used is a columnar or otherwise compact form this must be noted as it may affect the projected canopy coverage.
 - c. Caliper for deciduous trees or height for evergreens.
 - d. Root condition - balled and burlapped or container.
 - i. The twenty (20) year canopy coverage projections are based in two (2) inch caliper balled and burlapped trees, using nursery stock that is larger, smaller or containerized may impact canopy credit awarded from plantings. Contact the Director of DPR and/or their designated staff for a determination on applicable canopy coverage.
 - e. Quantity of trees.
 - f. The 20-year projected tree canopy coverage provided for each tree.
 - g. Additional canopy credits earned from applicable multipliers.
 - i. The Town Approved Tree List indicates which trees qualify for tree multiplier credits (air quality, water quality, wildlife benefit, local ecotype native tree, improved cultivars and varieties).
 - ii. New trees may claim up to two (2) multiplier credits, if applicable.

2. Graphic depiction of where the new trees will be installed on the site, with the existing trees, property boundaries, sidewalks, curb and gutter, proposed site features, proposed grades, the limits of disturbance, all existing and proposed overhead and underground utilities, etc.
 - a. Proposed trees shall be shown on the plan at scale in their 20-year project **base Canopy Coverage Area (CCA)**.
 - i. 100CCA trees shall have a scaled radius of 5.64'
 - ii. 150CCA trees shall have a scaled radius of 6.91'
 - iii. 200CCA trees shall have a scaled radius of 7.98'
 - iv. 250CCA trees shall have a scaled radius of 8.92'
 - v. 300CCA trees shall have a scaled radius of 9.77'
 - b. Spacing of new trees shall be based on their pre-multiplier (base) CCA.
 - c. New trees shall be allowed to grow to their twenty (20) year canopy coverage area without significant overlap with any other tree whether newly planted or existing.
 - d. The twenty (20) year canopy coverage area from new trees must be wholly contained on the site under development.
 - e. Trees should not be planted under or near overhead utilities as maintenance pruning for this infrastructure will impact canopy development.

- f. Trees shall be planted far enough away from all property lines to allow for unimpeded 20-year canopy coverage development to be wholly contained on site.
- g. Trees should be planted no closer than ten (10) feet from any underground utilities.
- h. It is the responsibility of the applicant to ensure that contractors and installers understand the necessary spacing requirements for trees at the time of installation.
- i. Trees not spaced appropriately may be rejected until corrected.

Trees in the RMA, RPA and SWM Systems

Resource management area (RMA), Resource protection area (RPA) and Storm Water Management (SWM) all refer to land use designations or systems primarily created to mitigate negative impacts to local and regional water bodies. Specific definitions and information about these designations as they apply to development within the Town can be found in [Section 18-238](#) and [Chapter 23](#) of the Town code.

Existing trees in the RMA, RPA and SWM systems must be inventoried according to standards and procedures set forth in this guide. The canopy area of trees in the RMA, RPA and SWM systems shall be counted in all canopy coverage calculations, except those which are **Restricted Trees** subject to the provisions for those species as outlined in this guide. RMA, RPA and SWM trees shall qualify for the preservation multiplier, if meeting the preservation criteria.

Trees planted in the RMA and RPA must first conform to the vegetation planting standards for plantings in the RMA and RPA as outlined in the [Town Public Infrastructure Manual \(PIM\) Chapter 2 Section 4-B](#) and as reviewed and approved by the Director of Public Works and and/or their designated staff. Trees planted in the RMA and RPA shall qualify for the “Water Quality” multiplier as shown in the **Canopy Coverage from Tree Installation** section of this guide, however if the necessary planting density to meet the standards set forth in the PIM conflict with the spacing requirements for trees set forth in this guide then the proposed trees may be awarded less than their full CCA. A review of these trees and their qualifying canopy credit should be confirmed by the Director of DPR and/or their designated staff during the site plan review process.

Trees planted in SWM systems, such as planter boxes or rain gardens will also qualify for the “Water Quality” multiplier show in the **Canopy Coverage from Tree Installation** section of this guide. Trees planted in these types of systems must first conform to the planting standards and densities prescribed by the [Virginia Department of Environmental Quality Storm Water Management Handbook](#), however if the necessary planting density to meet the standards set forth in the DEQ SWM Handbook conflict with the spacing requirements for trees set forth in this guide then the proposed trees may be awarded less than their full CCA. A review of these trees and their qualifying canopy credit should be confirmed by the Director of DPR and/or their designated staff during the site plan review process.

II. Tree Protection, Removal and Pruning

Before any grading, demolition, tree removal or other disturbance, a preconstruction meeting shall be held with the Director of DPR and/or their designated staff. The applicant shall stake the LOD onsite to help locate the areas for trenching and fence installation for tree protection.

If a violation of the approved tree preservation plan occurs, including encroachment or evidence of encroachment into a tree preservation area, the applicant may be required to submit a mitigation plan to the Director of DPR and/or their designated staff. This plan shall list remedial measures and the time within which such measures shall be completed by the applicant to ensure the continued preservation of the existing trees. This may require an assessment and report conducted by a qualified arborist.

If encroachment in the tree preservation area causes damage that cannot be mitigated, trees may be disqualified from receiving canopy credit at the discretion of the Director of DPR and/or their designated staff and a revised tree preservation and planting plan shall be required. If damage from construction activities causes any tree to become hazardous the Town may require the applicant to remove it in accordance with standards in this guide. See [Hazardous Conditions Relating to Construction Impacts](#) for more information.

Tree Protection

1. Tree protection measures shall be installed as shown on the approved plan before any site work including demolition, grading, and tree removal commences. No changes shall be made to the approved tree preservation plan unless approved by the Director of DPR and/or their designated staff. Documentation of approved changes must be submitted with subsequent revisions, or if none then with the closeout documents for review.
 - a. Tree protection areas shall be kept free from soil, vehicles, equipment, and the storage of construction materials. This period extends through the entirety of the project including final grading and landscaping activities.
 - b. The use of heavy equipment is strictly prohibited in tree preservation areas, for the removal of unwanted trees, structures, pads, grading, sodding, etc. Hand tools and light equipment (e.g. Wheelbarrows, walk behind aerator, etc.) may be used in tree preservation areas for material removal and appropriate landscaping activities.
 - i. Shallow tilling less than two (2) inches deep for sodding or seeding preparation, done using light equipment may be acceptable.
 - c. Removal of any tree preservation measure may require pre-approval by the Director of DPR and/or their designated staff prior to removal of any tree preservation measures. Otherwise notice should be given to the Director of DPR and/or their designated staff when tree preservation measures are being removed.

- d. Tree preservation area delineation should be maintained until the completion of the development, and final occupancy granted.
2. When applicable, trenchless silt fence shall be used for erosion and sediment control to better protect and preserve trees that may be impacted by construction activities.
 3. Root Pruning Requirements: Unless otherwise instructed by the Director of DPR and/or their designated staff, root pruning shall be performed when limits of disturbance fall within the critical root zone of trees to be retained.
 - a. The root pruning trench shall be excavated to a minimum depth of **eighteen (18)** inches at the locations shown on the approved site plan. A vertical trenching machine, vibratory plow, or supersonic air tool are all acceptable tools for root pruning.
 - b. All roots greater than one (1) inch in diameter shall be cut on the side of the trench closest to the tree trunk. Hand pruners, loppers, handsaw, or other appropriate tool that can cleanly sever the root shall be used for this purpose.

Tree Removal

1. Removal of trees, per the approved plan, inside a tree preservation area shall be performed, by hand, without unnecessary ground disturbance, or disturbance to nearby preserved trees. Trees in these areas shall be cut flush to the ground, without stump grinding unless approved by the Director of DPR and/or their designated staff.
2. Removal of offsite, joint/shared/co-owned, Town-owned or ROW trees without permission is prohibited. Written permission should be obtained and submitted with project documentation.
 - a. Any pruning or removal of Town-owned or ROW trees during the construction process shall be pre-approved by the Director of DPR and/or their designated staff. Unplanned damage or destruction of Town-owned trees during the construction process shall be mitigated by the applicant at their expense, at the direction of the Director of DPR and/or their designated staff. Failure to do so shall result in certificate of occupancy being withheld until remediation or replacement is complete.

Tree Pruning

All tree pruning shall be done following current [American National Standards Institute \(ANSI\) A300 pruning standards](#). Pruning to remove more than 10% of the total foliage, for trees being preserved for canopy coverage credit, shall be communicated and approved by the Director of DPR and/or their designated staff before the pruning. Pruning in excess of 10% or in such a manner that previously approved canopy area credit is significantly diminished without prior communication with the Director of DPR and/or their designated staff shall constitute a violation of the tree preservation standards and may require applicant to provide new canopy coverage calculations and mitigate any deficiencies with additional tree planting.

Invasive Species and Vines

Tree protection areas shall have vines removed or severed and should be treated (under Virginia's pesticide application laws) to prevent their regrowth. Any additional invasive species control for plants, insects, or diseases that are noted, described or otherwise delineated in the approved plan, regardless of applicable Town, County or State code will be required to be completed and inspected as a part of the requirements for project close-out or the certificate of occupancy.

Hazardous Conditions Relating to Construction Impacts

Per the Town Code Section 17-3001 any tree on the site under development which has been impacted by construction and which presents a dead, dying or other hazardous condition may require removal or mitigation at the direction of the Director of DPR and/or their designated staff. Construction impacts include if the CRZ of the tree intersects by any amount the LOD and any construction activity in the tree preservation area whether authorized (e.g. allowed removal of building by hand) or unauthorized (anything that constitutes a violation of the tree preservation area requirements). The Town will consider potential targets including public spaces, on-site property and off-site property, and the uses of those spaces therein, when evaluating potentially hazardous conditions. Trees which are dead or dying and do not appear to pose a threat to life or property may be retained in part or whole for wildlife benefits at the discretion of the applicant.

Trees on the site under development which are dead, dying or hazardous and which have not been impacted by construction activities will not require removal unless the condition demonstrates a hazard to public areas. The Town may suggest the applicant have dead, dying or hazardous trees re-evaluated by a qualified arborist. If trees were initially counted for preservation credit but develop a dead, dying or other hazardous condition which the Director of DPR and/or their designated staff determine disqualify the trees from receiving that credit the applicant may mitigate the conditions or if necessary remove the impacted tree and replant with the same species to re-capture some or all of the lost canopy credits. If the applicant chooses not to mitigate the tree issues then no credit will be awarded and the applicant may be required to plant additional trees on their site to meet canopy coverage requirements. If the applicant does not agree with a determination about the quality and conditions of a tree, specifically as it applies to qualifying for canopy credit the applicant must submit supporting documentation completed by a qualified arborist assessing the quality and condition of the tree, clearly showing how the condition of the tree warrants canopy credit. This will be reviewed by the Director of DPR and/or their designated staff in consultation with the Director of DPZ and/or their designated staff.

Besides clear signs of death or dying, such as absence or significant loss of foliage during the growing season, dry brittle twigs and fungal fruiting bodies, some conditions that warrant further investigation for elevated risk conditions are:

- Observable damage to structural roots.
- Root plate deformation, especially with wind.
- Cracks on trunks or branches.
- Wounding on surface roots, trunk or branches.

III. Plant Installation

Tree Planting Specifications

1. Plants shall be furnished and installed as indicated on the approved landscape plan.
2. Trees shall be installed during an approved planting season or otherwise bonded for performance or planting during the next available planting season. See [Tree Planting Season](#).
3. New plants shall be healthy and vigorous, typical of the species and variety, and meet the most recent [ANSI A300 Standards](#) published by the American Horticulture Industry.
4. New trees shall be a minimum of two inches (2") caliper for deciduous trees and six feet (6') in height for evergreens.
 - a. Permission for smaller caliper (less than 2" caliper) trees may be permitted with prior approval by the Director of DPR and/or their designated staff.
 - b. Tree caliper is measured at 6 inches above ground as specified in ANSI Z60.1.
5. Tree installation shall comply with the latest version of ANSI A300 Part 6 Tree Planting Best Management Practices and the [Virginia Cooperative Extension Tree and Shrub Planting Guidelines Publication 430-295](#).
 - a. The Director of DPR and/or their designated staff may require inspection and approval of trees required on the approved site plan before installation. Additionally, the installation location and the climatic conditions may require evaluation and approval before installation.
 - b. Tree root ball correction shall be conducted on all new trees in accordance with the specifications and details provided by [The Urban Tree Foundation](#) which can also be found in the [Appendix](#).
6. All plants shall have their container removed before planting and for balled and burlapped trees, a minimum of the top half of the wire basket and burlap cut away and removed from the planting hole. All twine, rope, trunk protection, tags, ribbon, etc., shall be removed from the trees and planting holes.

7. Trees shall be planted at the height of the surrounding grade with root flares visible.
8. All trees planted shall receive a maximum three (3) inch thick layer of shredded hardwood mulch. Mulch should be applied in a six (6) foot ring surrounding the tree (three (3) foot radius from tree center), with a six (6) inch gap from the trunk.
9. Staking of trees shall only be required if deemed appropriate by the Director of DPR and/or their designated staff. If required, staking shall meet ANSI A300 standards.
 - a. Metal wire guy lines shall not be used.
 - b. Staking materials should be removed no later than 1 year after planting unless specified otherwise by a qualified arborist after inspection of trees for establishment.
10. Deer protection should be provided on the trunks of new trees. Deer protection measures shall be loose fitting and non-constricting, it should extend from the root collar to just below the first lateral branch, or up to 5' from the ground. Multi-stem and evergreen trees such as *Amelanchier spp.* may require fencing or caging for deer protection.
 - a. Follow up inspections by a qualified arborist every 1 to 2 years is recommended to assess continued need or removal of deer protection.
 - b. **Trees damaged by deer may fail final inspection and require replacement.**
11. Trees shall be allowed to grow to their 20-year canopy credit without significant overlap with other trees, whether newly planted or existing. The base 20-year tree canopy cover area value shall be used for drawing trees to scale on the landscape plan and to determine minimum spacing. Refer to [“Proposed trees shall be shown on the plan at scale in their 20-year project base Canopy Coverage Area \(CCA\).”](#) for reference radius measurements which are the minimum distance requirements.
12. Trees shall be planted far enough away from all property lines to allow for unimpeded 20-year canopy coverage development to be wholly contained on site.
13. Trees should be planted no closer than ten (10) feet from any underground utilities.
14. It is the responsibility of the applicant to ensure that contractors and installers understand the necessary spacing requirements for trees at the time of installation. Trees not spaced appropriately may be rejected until corrected.

Tree Planting Season

Plants installed for canopy coverage requirements, RPA requirements and landscape buffers shall be installed when weather and soil conditions are conducive to planting.

Generally, plants shall not be installed when soil is frozen, saturated with water or during times of excess heat and drought.

The following planting seasons are desirable for plants to acclimate to their new home:

- a. **Spring Planting Season:** March 1 – June 15
- b. **Fall Planting Season:** September 15 – December 31

Any tree planted outside of acceptable conditions and the planting seasons without the Director of DPR and/or their designated staff's approval may be rejected or subject to a performance bond that may be in effect for up to one year at the discretion of Town Staff.

Tree Bonding: Seasonal Planting Deferral and Planting Performance Bond

For information on ROW and Town-Owned tree bonds [Town-Owned and ROW Trees](#).

1. A Seasonal Planting Deferral may be issued for projects when construction is complete but the environmental conditions or planting seasons do not align with the previously stated planting requirements. The deferral is applied with a conditional or partial pass occupancy inspection.
2. A Planting Performance Bond may be issued to projects where tree planting occurred outside of the acceptable tree planting seasons. Planting outside of the accepted seasons constitutes a violation of the approved plan, and performance bonds should be avoided.
3. To secure bonding the applicant shall post cash or surety that covers any plantings required on the site.
 - a. The bond amount per tree is set at the most recently published Unit Price Schedule used by Fairfax County for either:
 - i. Two (2) inch caliper deciduous trees.
 - ii. Six (6) foot evergreen trees.
 - b. The bond amount for tree removals reflects the most current Town-negotiated contract prices.
4. For Seasonal Planting Deferrals the necessary materials to meet all Town approved site requirements must be planted during the next available planting season.
5. A Seasonal Planting Deferral bond will be released to the applicant once a final planting inspection is completed.
6. A Performance Bond may be held for up to one year and will be released after successful inspections show that either the landscape materials are healthy, or if they have not

survived, have been replaced with nursery stock meeting the standards in this guide and planted in accordance with the installation specifications described in this guide.

Inspections

Inspections will be conducted by the Director of DPR and/or their designated staff. Inspections will begin with the pre-construction meeting and continue through to project completion and final occupancy inspection.

Applicants will be notified of any violations via email and/or phone, violations will be recorded in project records. All necessary steps for preservation and planting as outlined in this guide must be adhered to, if not observed by the Director of DPR and/or their designated staff records of required activities (such as root pruning) shall be furnished by applicants. Records may include photographs, receipts, invoices, reports, communication logs, etc.

Notice of activities such as tree protection installation, plantings and final grading activities is encouraged so that the Director of DPR and/or their designated staff is aware of those activities to provide immediate feedback and avoid violations of the procedures set forth in this guide. Removal of any tree preservation measure may require pre-approval by the Director of DPR and/or their designated staff. Otherwise notice should be given to the Director of DPR and/or their designated staff when tree preservation measures are being removed.

Staff may conduct inspections at any point throughout the development process. Applicants may request additional inspections from the Director of DPR and/or their designated staff at any time throughout the project using the Town's online development project review and tracking system. Inspection requests should be made at least three (3) days in advance of desired inspection date.

Initiation of the following inspection schedule by the applicant/project manager is recommended to avoid preservation and planting issues throughout the development process:

1. A pre-construction meeting with the Director of DPR and/or their designated staff shall be held onsite prior to establishing perimeter controls so that the Director of DPR and/or their designated staff can explain protection measures to operators, construction supervisors, and/or contractor's representatives. This inspection is required.
 - a. The LOD should be painted or staked out at this time to ensure compliance with the approved land disturbance area.
2. Tree Preservation measure installation.
3. Mid-construction check-in after the foundation has been poured.
4. Prior to removal of any tree preservation measure.
5. Inspection of nursery stock before or during the tree installation.
6. Certificate of Occupancy. This inspection is required

IV. Town-Owned and ROW Trees

ROW Tree Requirements

1. Town-owned and ROW trees shall not be tagged but may be flagged.
2. Any pruning or removal of Town-owned or ROW trees during the construction process shall be pre-approved by the Director of DPR and/or their designated staff. Unplanned damage or destruction of Town-owned trees during the construction process shall be mitigated by the applicant at their expense, at the direction of the Director of DPR and/or their designated staff. Failure to do so shall result in certificate of occupancy being withheld until remediation or replacement is complete.
3. Town-owned and ROW trees removed because of construction shall be replaced by the applicant at their expense.
 - a. It shall be noted in the plan that the final tree species selection(s) and location(s) will be at the discretion of the Director of DPR and/or their designated staff. Placeholder symbols will be used to graphically depict possible planting areas but will not be binding or final.
 - b. Determinations about tree locations shall be made after all utility, sidewalk and driveway work has been completed.
 - c. Any replacement tree planted without consultation with the Director of DPR and/or their designated staff may be rejected upon inspection.
 - d. If suitable locations for replacement trees cannot be found on the site adjacent ROW or Town property, then the tree bond will be released.
 - e. All trees planted on Town Property or in the ROW shall be balled and burlapped, two (2) inches in caliper or greater, single-stemmed, and have good form for the species. Species and variety selection shall be approved by the Director of DPR and/or their designated staff.
4. ROW trees in the Windover Heights Historic District shall be replaced with Eastern redcedar, (*Juniperus virginiana*) unless directed otherwise by the Director of DPR and/or their designated staff OR the Director of the Department of Planning and Zoning and/or their designated staff.
5. Town-owned and ROW trees shall be properly installed and mulched by the applicant. Mulching for ROW trees located between a sidewalk and curb five (5) feet or less in width shall have a square mulch bed around the tree extending from curb to sidewalk. Mulch shall be no greater than three (3) inches thick. See [Figure 3](#).

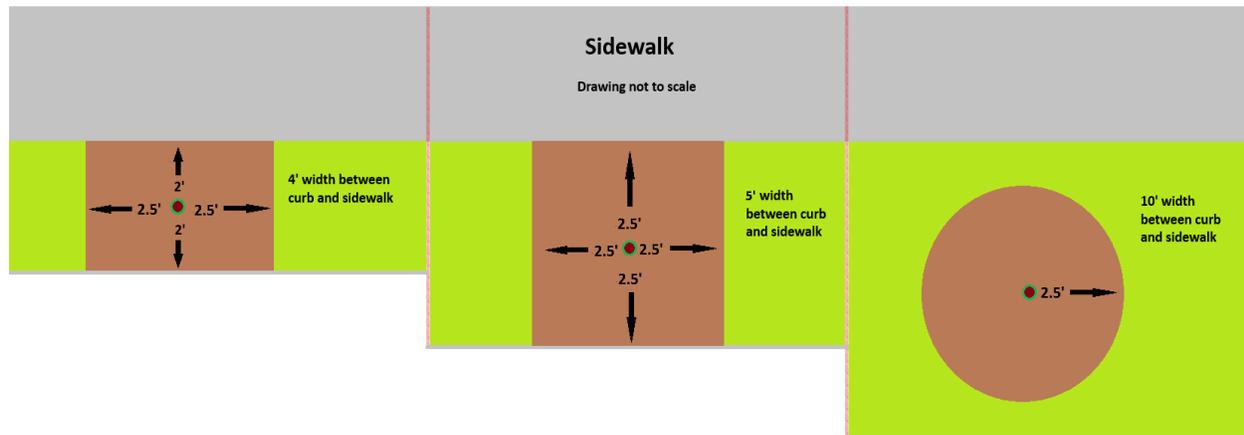


Figure 3. ROW tree mulching illustration of various planting strip widths and the mulching expectation for tree installation.

Tree Bonding

1. The Town of Vienna shall collect a Tree Bond for all ROW and Town-owned trees that will be removed as a result of approved construction activities.
2. The Director of DPR and/or their designated staff will initiate the bond paperwork and send it to the applicant to complete and sign. The applicant must post the bond at the Town Finance Department. Once paid, attach a copy of the receipt with the approved bond form and upload both to the project documents in the Town plan review system.
3. A Tree Bond shall be submitted before receiving a final demolition letter or in the event there is no demolition phase/permit, the Tree Bond will be attached to the relevant development permit.
4. The term of Vienna's Tree Bond includes a one (1) year performance period. The term starts on the same day the Certificate of Occupancy is approved and released to ensure tree survival and establishment.
 - a. Any trees that do not survive the one (1) year performance period shall be replaced at the applicant's expense. It is recommended that the applicant establish a tree maintenance regimen for the first (1) year.
5. Please contact the Director of DPR and/or their designated staff to perform a final inspection of the bonded trees approximately one (1) week before the one (1) year mark.

V. Deviations From Approved Plans

Any changes to the extent or location of the LOD, or changes on the site that necessitate recalculation of any part of the canopy coverage (aside from changes in the planting schedule) will require a plan revision submission for review in the Town plan review system.

All project plans should be faithfully followed through to the completion of the project, however in some instances, conditions change which require a deviation from the approved plan. These can include but are not limited to:

- Availability of nursery stock to meet planting specifications.
- Construction errors that irreparably damage trees meant to be preserved.
- Environmental factors that kill or necessitate the removal of trees such as extreme weather, pests, and diseases.

In some cases, deviations are sought to change the species composition and location of proposed trees due to client input.

At the discretion of the Director of DPR and/or their designated staff minor deviations such as the location of trees and species substitution of trees with the same or substantially close CCA may be approved in writing without the need for the re-submittal of project plans, however, if the changes are significant and alter the canopy coverage calculations then the project plan will need to be re-submitted for review in the plan review system.

The Director of DPR and/or their designated staff must be contacted with any proposed deviations for review.

Deviations that involve retaining trees that were planned to be removed after any construction/land disturbance activity has commenced will at minimum require re-evaluation by a certified arborist to assess the impacts to, and health of the tree(s) and the resubmittal of the project plan after having met with the Director of DPR and/or their designated staff on site to discuss the proposed changes. At the discretion of the Director of DPR and/or their designated staff additional analysis may be required.

VI. Town Contact Information

For more questions about this guide, please contact the Town of Vienna Arborist.

Town Arborist

Townarborist@viennava.gov

703-255-6309

VII. Glossary

- ANSI A300- [American National Standards Institute Standard for Tree Care](#)
- ANSI Z60.1- [American National Standards Institute Standard for Nursery Stock](#)
- APLD- [Association of Professional Landscape Designers](#)
- ASCA- [American Society of Consulting Arborists](#)
- CCA- Canopy Coverage Area
- CRZ- Critical Root Zone
 - For single stem trees is measured at one and one half (1.5) feet of radius per one (1) inch of DBH.
 - For multi-stem trees shall be measured at 2.0 feet per one (1) inch DBH, with the DBH calculated using the sum-of-squares method.
- DBH- [Diameter at Breast Height](#)
- DPR- [Department of Parks and Recreation](#)
- DPW- [Department of Public Works](#)
- DPZ- [Department of Planning and Zoning](#)
- ISA- [International Society for Arboriculture](#)
- LOD- Limits of Disturbance
 - Otherwise may be known as extent of clearing
- ROW- Right of Way
- RMA – Resource Management Area
- RPA- Resource Protection Area
- [Sum of Squares](#): Measure the DBH of each trunk. Square each DBH measurement. Add all squared DBH measurements together. Take that total calculated amount and square-root that number. Round to the nearest whole number. The resulting number is the calculated DBH.
- SWM- [Storm Water Management](#)
- TPT- Tree Preservation Target
 - The percentage of the site covered by tree canopy at the time of plan submission which equates to the minimum portion of the required canopy coverage percentage, by zoning, that shall be provided through tree preservation.
 - [Virginia Code § 15.2-961.1.](#)

VIII. Appendix

Useful Links

- [Measuring Tree Diameters](#)
- [ANSI A300 Tree Care Standards](#)
- [Proper Mulching Techniques](#)
- [Treatment of Trees Damaged by Construction](#)
- [Avoid Damage During Construction](#)
- [Preventing Construction Damage to Trees](#)
- [Relative Tolerance of Tree Species to Construction Damage](#)
- [Preventing Grade Change Damage to Trees](#)
- [Avoid Utility Conflict](#)
- [International Society of Arboriculture Design Details](#)
- [Tree Canopy Spread & Coverage in Urban Landscapes](#)
- [VA Invasive Plants Species List](#)
- [Digital Atlas of the Virginia Flora](#)
- [Habitat for Wildlife | Virginia DWR](#)
- [Native Plants for Wildlife — Northern Virginia Bird Alliance](#)
- [DEQ Virginia Stormwater Management Handbook](#)
- [Trees for Problem Landscape Sites -- Air Pollution | Virginia Tech](#)
- [Volatile Organic Compound Emissions from Plant Species and an Analysis of Their Potential Air Quality Impacts](#)
- [ISA Basic Tree Risk Assessment Instructions](#)
- [Structural Defects, Tree Failure, and Risk](#)
- [Tree Steward Manual](#)

Tree Inventory, Plan and Calculations Checklist

Trees Included in Inventory

- On-site Deciduous trees >4 inch DBH
- On-site Evergreen trees >6 feet tall
- Any tree included in canopy coverage calculations that is less than the on-site inventory requirements but greater than 5 feet tall.
- Adjacent ROW or Town-Owned trees
- Shared trees
- Off-site trees whose CRZ intersects LOD

Trees Shown on Plan

- On-site Deciduous trees >4 inch DBH
- On-site Evergreen trees >6 feet tall
- Any tree included in canopy coverage calculations that is less than the on-site inventory requirements but greater than 5 feet tall.
- Adjacent ROW or Town-Owned trees
- Shared trees
- Off-site trees whose CRZ intersects LOD

Trees Included in Canopy Coverage Calculations

- On-site Deciduous trees >4 inch DBH
- On-site Evergreen trees >6 feet tall
- Trees greater than 5 feet in height but less than the on-site inventory requirements may be included in the total existing and (if applicable) preserved canopy coverage calculations

Trees NOT in Canopy Coverage Calculations

- Restricted Trees
- Shared Trees
- ROW or Town-Owned Trees
- Off-site Trees

Parks Construction Site Inspection Checklist:

- Tree protection fencing (typical requirement) in correct place and properly installed/maintained.
- Other tree protection measures as prescribed in approved plan or field revisions are in place and properly installed/maintained.
- Tree preservation area free of construction debris, equipment, etc.
- No incursions in tree preservation by equipment, vehicles, etc.
- Town ROW trees protected if necessary, or removed if approved in plan.

Parks Construction Occupancy Inspection Checklist:

- Tree preservation area maintained.
- Grading in tree area, if any, is minimal, done with hand tools (use soil probe to assess changes in profile)
- Preserved trees are not significantly impacted from pruning, if at all. Pruning done to ANSI standards. Elevated risk conditions not present or reduced if noted in prior inspections or in arborist comments on initial tree inventory.
- Vines cut from preserved trees. If other invasive species removal is specified in approved plan then invasive species removed per specifications in plan.
- Planted trees meet ANSI standards & canopy coverage requirements.
 - Spacing
 - Depth
 - Quality/Health/Form
 - Species
 - Deer protection for fall planted trees
 - Transplanting materials (burlap/twine, etc.) removed
 - If tree are staked it is done properly using textile based wraps and guying materials. Metal guy wires not recommended. Staking is only necessary in area with high wind forces or soils that do not compact or settle to sufficiently hold the root ball in place (generally not a problem in Vienna).
- SWM plantings
 - Appropriate species
 - Adequate number per DEQ standards per planter box
 - Plants in good health and condition
- RPA plantings
 - Located in RPA
 - Appropriate density as prescribed in plan
 - Appropriate species/conforms to approved planting schedule
 - Plants in good health and condition

Town of Vienna Restricted Trees List

Revised January 2026

Common Name	Scientific Name	Native Tree	Invasive	Pest Issues	Disease Issues	Poor Climate Adaptation	Weak/Brittle Wood	Existing Trees that May Qualify For Conditional Canopy Credit
box elder	<i>Acer negundo</i>	X					X	Only retained trees may qualify for conditional credit if the tree is in Good or Excellent condition (>75/.75/75%) and is located 1.5X total tree height away from any current or proposed structures.
Norway maple	<i>Acer platanoides</i>		X					No
silver maple	<i>Acer saccharinum</i>	X					X	Only retained trees may qualify for conditional credit if the tree is in Good or Excellent condition (>75/.75/75%) and is located 1.5X total tree height away from any current or proposed structures.
tree of heaven	<i>Ailanthus altissima</i>		X	X			X	No
mimosa	<i>Albizia julibrissi</i>		X					No
silk tree	<i>Albizia julibrissin</i>		X				X	No
white birch	<i>Betula papyrifera</i>					X	X	No
paper mulberry	<i>Broussonetia papyrifera</i>		X					No
Southern catalpa	<i>Catalpa bignonioides</i>						X	Only retained trees may qualify for conditional credit if the tree is in Good or Excellent condition (>75/.75/75%) and is located 1.5X total tree height away from any current or proposed structures.
Northern catalpa	<i>Catalpa speciosa</i>						X	Only retained trees may qualify for conditional credit if the tree is in Good or Excellent condition (>75/.75/75%) and is located 1.5X total tree height away from any current or proposed structures.
leyland cypress	<i>Cupressocyparis leylandii</i>				X			Only retained trees may qualify if in Good or Excellent Condition and are not exhibiting signs of disease.
Russian olive	<i>Elaeagnus angustifolia</i>		X					No
autumn olive	<i>Elaeagnus umbellata</i>		X					No
winged burningbush	<i>Euonymus alatus</i>		X					No
ash species	<i>Fraxinus spp.</i>	X		X				No
privet species	<i>Ligustrum spp.</i>		X					No
honeysuckle species	<i>Lonicera spp.</i>		X				X	No
white mulberry	<i>Morus alba</i>		X					No
princess tree	<i>Paulownia tomentosa</i>		X				X	No
Lombardy poplar	<i>Populus nigra 'Italica'</i>						X	No
white poplar	<i>Populus alba</i>						X	No
Eastern cottonwood	<i>Populus deltoides</i>	X					X	Only retained trees may qualify for conditional credit if the tree is in Good or Excellent condition (>75/.75/75%) and is located 1.5X total tree height away from any current or proposed structures.
callery pear	<i>Pyrus calleryana</i>		X				X	No
black locust	<i>Robinia pseudoacacia</i>	X					X	Only retained trees may qualify for conditional credit if the tree is in Good or Excellent condition (>75/.75/75%) and is located 1.5X total tree height away from any current or proposed structures.
weeping willow	<i>Salix babylonica</i>						X	Only retained trees may qualify for conditional credit if the tree is in Good or Excellent condition (>75/.75/75%) and is located 1.5X total tree height away from any current or proposed structures.
Canadian/Eastern hemlock	<i>Tsuga canadensis</i>	X		X		X		No
Carolina hemlock	<i>Tsuga caroliniana</i>			X		X		No
Siberian elm	<i>Ulmus pumilia</i>		X				X	No

Town of Vienna Landscape Tree List

Revised February 2026

Common Name	Scientific Name	Evergreen	Air Quality (1.5)	Water Quality (Trees in RPA and SWM only) (1.25)	Local Ecotype (1.5)	Wildlife Benefit (1.5)	Improved Cultivars & Varieties (1.25)	Planted Canopy Coverage Credit is Conditional	Preferred Vegetative Buffer Species	20-Year Canopy Credit Allowance (CCA)	Notes
Trident Maple	<i>Acer buergerianum</i>								No	100	
Paperbark Maple	<i>Acer griseum</i>								No	100	
Fullmoon Maple	<i>Acer japonicum</i>								No	100	
Japanese Maple	<i>Acer palmatum</i>								No	100	
Red Maple	<i>Acer rubrum</i>		1.5	1.25	1.5	1.5		Yes	Canopy	300	Planted trees must be located 1.5X average mature tree height away from any current or proposed structures.
Silver Maple	<i>Acer saccharinum</i>								No	300	
Sugar Maple	<i>Acer saccharum</i>								Under	200	
Freeman Maple	<i>Acer x freemanii</i>								Canopy	300	
Yellow Buckeye	<i>Ascutus flora</i>			1.25					Under	200	
Ohio Buckeye	<i>Ascutus glabra</i>		1.5						Under	200	
Bottlebrush Buckeye	<i>Ascutus parviflora</i>								Shrub	150	
Red Buckeye	<i>Ascutus speta</i>								Under	150	
Downy Serviceberry	<i>Ameiandier arborea</i>			1.25					Under	150	Improved cultivars include single stem
Shadblow Serviceberry	<i>Ameiandier canadensis</i>			1.25					Shrub	100	Improved cultivars include single stem
Allegheny Serviceberry	<i>Ameiandier laevis</i>			1.25			Possible		Under	150	Improved cultivars include single stem
Pawpaw	<i>Asimina triloba</i>			1.25	1.5	1.5			Under	100	
Sweet Birch	<i>Betula lenta</i>				1.5	1.5			Canopy	200	
River Birch	<i>Betula nigra</i>			1.25	1.5	1.5			Under	300	
European Hornbeam	<i>Carpinus betulus</i>								Under	100	
American Hornbeam	<i>Carpinus caroliniana</i>			1.25	1.5	1.5			Under	150	
Bitternut Hickory	<i>Carya cordiformis</i>				1.5	1.5			No	200	
Pignut Hickory	<i>Carya glabra</i>				1.5	1.5			No	200	
Pecan Hickory	<i>Carya illinoensis</i>		1.5						No	200	
Shagbark Hickory	<i>Carya ovata</i>				1.5	1.5			No	200	
Mockernut Hickory	<i>Carya tomentosa</i>				1.5	1.5			No	200	
American Chestnut	<i>Castanea dentata</i>				N/A	1.5	1.25	Yes	No	200	To qualify for conditional credit and cultivar multiplier new trees must be chestnut blight resistant cultivars.
Chinese Chestnut	<i>Castanea mollissima</i>								No	200	
Atlas Cedar	<i>Cedrus atlantica</i>	X							Under	200	
Deodar Cedar	<i>Cedrus deodara</i>	X							Under	200	
Hackberry	<i>Celtis occidentalis</i>				1.5	1.5			Canopy	300	
Katsuratre	<i>Cercidiphyllum japonicum</i>								Under	200	
Eastern Redbud	<i>Cercis canadensis</i>			1.25	1.5	1.5			Under	200	
Port Orford Cedar Falsecypress	<i>Chamaecyparis lasosortina</i>	X							Under	100	
Hinoki Falsecypress	<i>Chamaecyparis obtusa</i>	X							No	100	
Atlantic Whitecedar	<i>Chamaecyparis thyoides</i>	X		1.25					Under	100	
Chinese Fringetree	<i>Chionanthus retusus</i>								Under	200	
Fringetree	<i>Chionanthus virginicus</i>			1.25	1.5	1.5			Under	100	
Yellowwood	<i>Cladrastis kentuckia</i>								Under	200	
Flowering dogwood	<i>Cornus florida</i>			1.25	1.5	1.5	Possible		Under	150	Improved cultivars for disease resistance
Kousa dogwood	<i>Cornus kousa</i>								Under	150	
Cornelancherry dogwood	<i>Cornus mas</i>								Under	150	
Hawthorn	<i>Crataegus spp.</i>				1.5	1.5	Possible		No	100	Improved cultivars for diseases or thorns
Japanese Cryptomeria	<i>Cryptomeria japonica</i>	X							Under	150	
Persimmon	<i>Diospyros virginiana</i>				1.5	1.5			No	150	
American Beech	<i>Fagus grandifolia</i>			1.5	1.5	1.5			Canopy	300	
European Beech	<i>Fagus sylvatica</i>								Canopy	200	
Ginkgo	<i>Ginkgo biloba</i>		1.5					Yes	Canopy	200	Male Trees Only
Thornless Honeylocust	<i>Gleditsia triacanthos 'inermis'</i>			1.25					Canopy	250	
Kentucky Coffeetree	<i>Gymnocladus dioica</i>								No	200	
Carolina Silverbell	<i>Halesia carolina</i>								Under	100	
English holly	<i>Ilex aquifolium</i>	X							Under	150	

Town of Vienna Landscape Tree List

Revised February 2026

Common Name	Scientific Name	Evergreen	Air Quality (1.5)	Water Quality (Trees in RPA and SWM only) (1.25)	Local Ecotype (1.5)	Wildlife Benefit (1.5)	Improved Cultivars & Varieties (1.25)	Planted Canopy Coverage Credit is Conditional	Preferred Vegetative Buffer Species	20-Year Canopy Credit Allowance (CCA)	Notes
American holly	<i>Ilex opaca</i>	X		1.25	1.5	1.5			Under	150	
Nellie Stevens holly	<i>Ilex x 'Nellie Stevens'</i>	X							Under	200	
Foster's holly	<i>Ilex x 'Fosteri'</i>	X							Under	100	
Black Walnut	<i>Juglans nigra</i>				1.5	1.5			No	300	
Chinese Juniper	<i>Juniperus chinensis</i>	X							Under	100	
Eastern redcedar	<i>Juniperus virginiana</i>	X			1.5	1.5			Under	150	
Capemyrtle	<i>Lagerstroemia indica</i>								Under	200	
Sweetgum	<i>Liquidambar styraciflua</i>			1.25	1.5	1.5		Yes	No	200	Planted trees must not be in a location that may cause harm or damage to life and property from falling fruit.
Fruitless Sweetgum	<i>Liquidambar styraciflua 'Rotundiloba'</i>			1.25			1.25		Canopy	200	
Tulip Poplar	<i>Liriodendron tulipifera</i>		1.5		1.5	1.5			Canopy	300	
Osage Orange	<i>Maclura pomifera</i>							Yes	No	300	Male Trees Only
Cucumber Tree	<i>Magnolia acuminata</i>				1.5				Canopy	200	
Southern magnolia	<i>Magnolia grandiflora</i>	X							Canopy	250	Little Cam cultivar does not qualify for full canopy coverage, only qualifies for 150 CCA
Bigleaf Magnolia	<i>Magnolia macrophylla</i>								Canopy	100	
Saucer Magnolia	<i>Magnolia soulangeana</i>								Under	200	
Star Magnolia	<i>Magnolia stellata</i>								Under	200	
Sweetbay Magnolia	<i>Magnolia virginiana</i>			1.25	1.5	1.5			Under	150	
Crabapple	<i>Malus spp.</i>				1.5	1.5			Under	100	
Dawn Redwood	<i>Metasequoia glyptostroboides</i>	X							Canopy	250	
Red mulberry	<i>Morus rubra</i>				1.5	1.5			Under	250	
Black gum	<i>Nyssa sylvatica</i>			1.25	1.5	1.5			Canopy	300	
Eastern Lophombean	<i>Ostrya virginiana</i>				1.5	1.5			Under	200	
Sourwood	<i>Oxydendrum arboreum</i>					1.5			Under	100	
Norway Spruce	<i>Picea abies</i>	X							Canopy	150	
Shortleaf Pine	<i>Pinus echinata</i>	X			1.5	1.5			Canopy	200	
Pitch Pine	<i>Pinus rigida</i>	X			1.5	1.5			Canopy	250	
White pine	<i>Pinus strobus</i>	X			1.5	1.5			Canopy	300	
Loblolly Pine	<i>Pinus taeda</i>	X		1.25					Canopy	250	
Japanese Black Pine	<i>Pinus thunbergiana</i>	X							No	150	
Virginia Pine	<i>Pinus virginiana</i>	X			1.5	1.5			Canopy	250	
Sycamore	<i>Platanus occidentalis</i>	X		1.25	1.5	1.5			Canopy	300	
London Planetree	<i>Platanus x acerifolia</i>								Canopy	300	
Black cherry	<i>Prunus serotina</i>				1.5	1.5			No	250	
Kwansean cherry 'Kwansart'	<i>Prunus serrulata</i>								Under	200	
Okame Cherry	<i>Prunus x incana 'Okame'</i>								Under	150	
Japanese Cherry (hiigan)	<i>Prunus x subhirtella</i>								Under	250	Can have weeping form, but may qualify for reduced canopy credit.
Yoshino Cherry	<i>Prunus yedoensis</i>								Under	250	
White Oak	<i>Quercus alba</i>				1.5	1.5			Canopy	300	
Swamp White Oak	<i>Quercus bicolor</i>			1.25	1.5	1.5			Canopy	300	
Southern Red Oak	<i>Quercus falcata</i>				1.5	1.5			Canopy	300	
Shingle Oak	<i>Quercus imbricaria</i>				1.5	1.5			Canopy	300	
Bar Oak	<i>Quercus macrocarpa</i>				1.5	1.5			Canopy	300	
Swamp Chestnut Oak	<i>Quercus michauxii</i>			1.25	1.5	1.5			Canopy	300	
Chestnut Oak	<i>Quercus montana</i>				1.5	1.5			Canopy	300	
Chinkapin Oak	<i>Quercus muhlenbergii</i>				1.5	1.5			Canopy	300	
Pin Oak	<i>Quercus palustris</i>			1.25	1.5	1.5			Canopy	300	
Willow Oak	<i>Quercus phellos</i>			1.25	1.5	1.5			Canopy	300	
Northern Red Oak	<i>Quercus rubra</i>				1.5	1.5			Canopy	300	
Post Oak	<i>Quercus stellata</i>				1.5	1.5			Canopy	300	
Black Oak	<i>Quercus velutina</i>				1.5	1.5			Canopy	300	
Weeping Willow	<i>Salix babingtonia</i>				1.5	1.5		Yes	No	300	Planted trees must be located 1.5X average mature tree height away from any current or proposed structures.

Town of Vienna Landscape Tree List

Revised February 2026

Common Name	Scientific Name	Evergreen	Air Quality (1.5)	Water Quality (Trees in RPA and SWM only) (1.25)	Local Ecotype (1.5)	Wildlife Benefit (1.5)	Improved Cultivars & Varieties (1.25)	Planted Canopy Coverage Credit is Conditional	Preferred Vegetative Buffer Species	20-Year Canopy Credit Allowance (CCA)	Notes
Corkscrew Willow	<i>Salix matsudana</i>								No	300	
Black Willow	<i>Salix nigra</i>			1.25	1.5	1.5			No	200	
Sassaparilla	<i>Sassafras albidum</i>				1.5	1.5			Under	150	
Korean Stewartia	<i>Stewartia koreana</i>								Under	150	
Mountain Stewartia	<i>Stewartia ovata</i>								Under	150	
Japanese Stewartia	<i>Stewartia pseudacannella</i>								Under	150	
American Snowbell	<i>Syrinx americanus</i>					1.5			Under	150	
Japanese Snowbell	<i>Syrinx japonicus</i>								Under	150	
Japanese Tree Lilac	<i>Syringa reticulata</i>								Under	150	
Bald Cypress	<i>Taxodium distichum</i>			1.25		1.5			Under	250	salt tolerant
Oriental Arborvitae	<i>Thuja occidentalis</i>	X				1.5			Under	100	
Western Arborvitae	<i>Thuja plicata</i>	X							Under	100	
American Linden, Basswood	<i>Tilia americana</i>		X						Under	200	
Littleleaf Linden	<i>Tilia cordata</i>					1.5			Canopy	300	
American Elm	<i>Ulmus americana</i>				1.5			Yes	Canopy	250	
Japanese Zelkova	<i>Zelkova serrata</i>		1.5		1.25	N/A			Canopy	300	To qualify for conditional credit on new trees dutch elm disease resistant cultivars must be planted.

Canopy Coverage Analysis	
Instructions: Cells shaded green are for user inputs. For questions contact TOV Forestry Staff.	
Row	Project Address or Munis #: Test
A1	Gross site area sq. ft. 10,000
A2	Pre-development canopy coverage sq. ft. 1,285
A3	Percentage of gross site area covered by existing tree canopy (A2/A1) 12.9%
A4	Zone RS-10
A5	Percentage of 20-year Tree Canopy required for site (see zoning chart) 20%
A6	Minimum 20-year Tree Canopy required for site sq. ft. (A1xA5) 2,000
A7	Tree Preservation Target (minimum tree canopy area required via tree preservation) sq. ft. (A3xA6) 257
A8	Tree canopy provided through tree preservation sq. ft. (Auto-fills from sheet inventory; L1, otherwise manually input canopy area here) Box turns RED if preserved canopy is greater than existing canopy. Canopy credits will only be awarded to trees with trunks that are fully located on the development site. 1,021
A10	Has the Tree Preservation Target minimum been met? (A8>=A7) Yes
A11	If No, then submit a Tree Preservation Target Deviation Letter. Including a site-specific explanation of why the Tree Preservation Target cannot be met in accordance with the Tree Preservation Guide. #N/A
B1	Canopy from retained trees that qualify for credit sq. ft. (A8) 1,021
B2	Trees qualify for preservation if their current and projected 20 year condition is fair or better. See Tree Preservation guide for further details. Yes
B3	If not all retained canopy area qualifies for the preservation multiplier enter the canopy area that qualified here and select "Other" in the drop down above.
B4	Tree Preservation Multiplier Value (25%) (B1 OR B3x0.25) 255
B5	Total preserved canopy including multipliers sq. ft. (B1+B4) 1,276
C1	Canopy area that must be met with tree planting (A6-B4) 724
C2	Tree Canopy area to be met through tree planting with multipliers (Auto-fills from sheet Planting Plan V2:O1, otherwise manually input canopy area here) 2,275
D1	Total canopy area provided through tree preservation sq. ft. (B5) 1,276
D2	Total canopy area provided through tree planting sq. ft. (C2) 2,275
D3	Total 20 year projected canopy coverage provided (D1+D2) 3,551
D4	Total minimum 20 year canopy coverage required (A6) 2,000
D5	Total projected canopy coverage percentage (D3/A1) 36%
D6	Are canopy coverage requirements met? Yes
D7	If No, then submit a request for a waiver to contribute to the Tree Fund to cover the unmet portion of the required minimum tree canopy coverage. #N/A

Instructions for using this workbook

This workbook has been created to help applicants working in the Town of Vienna comply with the Town's tree conservation ordinance. The worksheets have many built in functions to help users understand their canopy coverage requirements, inventory their existing trees and create a planting plan to meet their canopy coverage requirements if planting is necessary. If prompted to enable content when opening this workbook please select "Enable" to active all of the features in this workbook. The canopy calculation sheet references the inventory sheet and planting sheet, however if users wish to input unique values from their own inventory and planting plans they are able to. This workbook has example values on every sheet pre-filled to demonstrate some of the features of the workbook and give users an idea of how it works. Generally cells shaded green can be edited by users, otherwise sheets are locked and protected to avoid breaking built in functions. All sheets can be spellchecked using Excel's spellcheck feature by pressing **Control+Q** at the same time. This is the only way to activate the spellcheck feature.

- Green cells allow for user input
- Purple cells show calculated values from inputs
- Blue, orange and tan cells contain instructions
- Cells that turn red or yellow indicate problems or special conditions

Project Address and/or Munis #:	Scientific Name	Common Name	Variety/Cultivar	Notation on Plan	Notes	Caliper (Deciduous) Height (Evergreen)	Balled and Burrapped or Container	Quantity (Units)	Base 20 Year CCA	Instructions: Select multipliers from dropdown if applicable to species, cultivar, variety or planting situation. Test multipliers do not effect calculated totals.	Air Quality (1.50)		Total CCA = 2,663				
											Water Quality (1.25)	CCA per tree after Multiplier(s)					
General Tree Information: Link to Tree Preservation Guide	Use Sum of Squares Calculator to Calculate Multistem Tree DBH	Use 1 Rating Type	Preservation Canopy Coverage= 459	Tree Protection	Notes												
Tree #	Scientific Name	Common Name	DBH (inches)	Multistem Tree	CRZ In feet (DBH-1.5) or (Calculated DBH-2)	Condition Rating Quantitative	Condition Rating Qualitative	20 Year Life Expectancy	On Site - Off Site - Shared - ROW	To Be Removed?	Canopy Area Credited	Root Prune	Fencing	Other Tree Protection	Remarks/Comments		
0	Genus species	Name	#	(blank) if "no" or X if "yes"	#	## or %	Poor/Fair/Good/Excellent	>/<	On/Off/ROW/Shared	(blank) if "no" or X if "yes"	#	(blank) if "no" or X if "yes"	(blank) if "no" or X if "yes"	Describe	Describe: Hide this row for sorting and filtering purposes, and when submitting a copy of this sheet with a plan.		
1	sample sample	the sample tree	10	X	20	75%		<	On	X	0	X		Chain embedded in trunk, girdling stem.			
2	sample sample	the sample tree	10		15	60		>	Shared	X	0			CHZ Impact greater than 30%			
3	sample sample	the sample tree	15	X	30		Fair	>	On		225	X		Vines on tree trunk			
4	sample sample	the sample tree	12		18		Good	>	Off			X					
5	sample sample	the sample tree	8		12		Poor	>	On					Decay at base			
6	sample sample	the sample tree	8	X	16		Excellent	>	On		234	X	X	Root padding, see detail	Pine to ANSI A300		
Template Row	Template Row	Template Row	Template Row	Template Row	(eg: "TR")	This row for testing and template		2" or 6"	BB or C	10	150	Test Multiplier 1	0	Test Multiplier 2	0	150	1500
Ginkgo biloba	Ginkgo	Willow Oak	Goldspleire	GP	Columnar, only container available	Other	2"	BB	1	100	Air Quality	0.5	Improved Cultivars	0.25	175	350	
Quercus phellos	Blackgum	American holly	IO	NS	Tree bag nursery stock	2"	BB	2	250	Wildlife Benefit	0.5	Wildlife Benefit	0	Wildlife Benefit	0.5	450	450
Ilex opaca	Blackgum	American holly	IO	NS	Tree bag nursery stock	6"	Other	3	150	Wildlife Benefit	0	Mid-Atlantic Ecotype	0.5	Water Quality	0.5	225	750
Nyssa sylvatica	Blackgum	Blackgum	NS	NS	Planted in rain garden SWM	2"	BB	1	250	Wildlife Benefit	0.5	Water Quality	0.25	Water Quality	0.25	438	438

TOWN OF VIENNA, VIRGINIA

Tree Bond/Seasonal Planting Deferral

Record ID #: XXXXXX

Munis ID: XXXXX

Date: XX/XX/XXXX

For questions contact the Town Urban Forester at 703-255-6358 or urbanforester@viennava.gov

To be completed by applicant:

Project Name:

Project Address:

Developer:

Developer Address:

Engineer or Surveyor (Firm):

Address:

Telephone

Prepared by:

Date:

Tree Removal & Stump Grinding	Tree #/ID(s) on site plan	Quantity	Unit	Unit Cost	Total
6" > 12" dbh			Each	\$650.97	\$ -
12" > 18" dbh			Each	\$1,379.17	\$ -
18" > 24" dbh			Each	\$2,151.51	\$ -
24" > 30" dbh			Each	\$2,813.51	\$ -
30" > 36" dbh			Each	\$3,839.62	\$ -
36" > 42" dbh			Each	\$4,634.02	\$ -
42" > 48" dbh			Each	\$5,902.86	\$ -
48" & larger dbh			Each	\$9,874.88	\$ -

Prices for removal reflect current Town Contract Prices.

Total removal costs: \$ -

Tree Replacement	Description	Quantity	Unit	Unit Cost	Total
Unit Price Schedule (fairfaxcounty.gov)	2" Caliper Deciduous Tree		Each	\$ 1,113.00	\$ -
Unit Price Schedule (fairfaxcounty.gov)	8' Evergreen Tree		Each	\$ 620.00	\$ -
Other:			Each		\$ -

Prices for replacement trees reflect current Fairfax County Unit Prices.

Total replacement costs: \$ -

Total Tree Bond: \$ -

Vienna Parks and Recreation

Date of inspection/review of site plan:

Town of Vienna Urban Forester
Signature:

Notes:

Protection, removal and replacement procedures shall be executed per the standards described in the Town's Tree Guide.

The Permittee shall guarantee the protection and/or removal and replacement work for a period of one (1) year after occupancy-Applicable to Subdivisions and ROW tree replacements.

Once paid attach a copy of the receipt with this form and upload to the project documents in the project review platform.

Signature of applicant: DRAFT

Date: DRAFT

Condition Rating for Landscape Trees

This table is a general representation to assist in formula values. The tree condition ratings described below encompass factors of a tree's health, form, and above- and below-ground structure. Each tree can have any combination of the following health or structural issues, as well as others not mentioned. The expression of symptoms and signs is subjective. The appraiser should consider individual tree species characteristics and use existing circumstances as a reasonable scale to determine a tree's condition.

Condition Rating	Tree Structure	Tree Health	Tree Form	Formula Values
Excellent	Root plate undisturbed and clear of any obstructions. Trunk flare has normal development. No visible trunk defects or cavities. Branch spacing/structure and attachments are free of any defects.	Perfect specimen with excellent form and vigor, along with a well-balanced crown. Trunk is sound and solid. No apparent pest problems. Normal to exceeding shoot length on new growth. Normal leaf size and color. Exceptional life expectancy for the species.	Ideal tree for that species, including shape and canopy symmetry, health, and density. Outstanding function on the site or location.	1.0-.90
Good	Root plate appears normal, with only minor damage. Possible signs of root dysfunction around trunk flare. Minor trunk defects from previous injury, with good closure and less than 25% of bark section missing. Good branch habit; minor dieback with some signs of previous pruning. Codominant stem formation may be present, requiring minor corrections.	Imperfect canopy density in 10% or less of the tree. Lacks natural symmetry. Less than half the normal growth rate and minor deficiency in leaf development. Few pest issues or damage, and controllable if present. Normal branch and stem development with healthy growth. Typical life expectancy for the species.	Nearly ideal tree for that species, including shape and canopy symmetry, health, and density. Functions well on the site or location.	.90-.75
Fair	Root plate reveals previous damage or disturbance. Dysfunctional roots may be visible around the main stem. Evidence of trunk damage or cavities, with decay or defects present and less than 30% of bark sections missing on trunk. Co-dominant stems are present. Branching habit and attachments indicate poor pruning or damage, which requires moderate corrections.	Crown decline and dieback up to 30% of the canopy. Poor overall symmetry. Leaf size smaller and color somewhat chlorotic. Shoot extensions indicate some stunting and stressed growing conditions. Obvious signs of pest problems contribute to a lesser condition. Some decay areas found in the main stem and branches. Below-average life expectancy for the species.	Acceptable tree for that species. Tree shape and symmetry are adequate, with some substantial asymmetry in shape and canopy form. May have considerable concerns for its use and function on the site or location.	.75-.50
Poor	Root plate disturbance and defects indicate major damage, with girdling roots around the trunk flare. Trunk reveals more than 50% of bark section missing. Branch structure has poor attachments, with several structurally important branches dead or broken. Canopy reveals signs of damage or previous topping or lion-tailing, with major corrective action required.	Lacking a full crown, with more than 50% decline and dieback that especially affects larger branches. Stunting obvious, with little evidence of growth on smaller stems. Leaf size and color reveals overall stress in the plant. Insect or disease infestation may be severe. Extensive decay or hollow characteristics. Low life expectancy for the species.	Poor tree for that species. Highly irregular canopy shape and undesirable form make it unattractive and dysfunctional on the site or location.	.50-.30
Very Poor	Severe damage within the root plate and root collar exhibits major defects that could lead to tree death or failure. A majority of the bark or trunk is affected, either decayed or missing. Branching is extremely poor or severely topped, with severe dieback in canopy. Little or no opportunity for mitigation of any tree parts.	More than 70% of the canopy is in severe decline or dead. Canopy density is extremely low, with chlorotic and necrotic tissue dominating the canopy. Severe decay in the trunk and major branches. Root plate damage with a majority of roots damaged, diseased or missing. Very low life expectancy for the species.	Disagreeable tree for that species, with highly diminished function and aesthetic appeal on the site or location.	.30 -.10
Dead				.10 or less



Basic Tree Risk Assessment Form

Client _____ Date _____ Time _____
 Address/Tree location _____ Tree no. _____ Sheet _____ of _____
 Tree species _____ dbh _____ Height _____ Crown spread dia. _____
 Assessor(s) _____ Time frame _____ Tools used _____

Target Assessment

Target number	Target description	Target zone			Occupancy rate 1 – rare 2 – occasional 3 – frequent 4 – constant	Practical to move target?	Restriction practical?
		Target within drip line	Target within 1 x Ht.	Target within 1.5 x Ht.			
1							
2							
3							
4							

Site Factors

History of failures _____ **Topography** Flat Slope _____ % **Aspect** _____
Site changes None Grade change Site clearing Changed soil hydrology Root cuts Describe _____
Soil conditions Limited volume Saturated Shallow Compacted Pavement over roots _____ % Describe _____
Prevailing wind direction _____ **Common weather** Strong winds Ice Snow Heavy rain Describe _____

Tree Health and Species Profile

Vigor Low Normal High **Foliage** None (seasonal) None (dead) Normal _____ % Chlorotic _____ % Necrotic _____ %
Pests _____ **Abiotic** _____
Species failure profile Branches Trunk Roots Describe _____

Load Factors

Wind exposure Protected Partial Full Wind funneling _____ **Relative crown size** Small Medium Large
Crown density Sparse Normal Dense **Interior branches** Few Normal Dense **Vines/Mistletoe/Moss** _____
Recent or planned change in load factors _____

Tree Defects and Conditions Affecting the Likelihood of Failure

— Crown and Branches —

Unbalanced crown LCR _____ % Cracks _____ Lightning damage
 Dead twigs/branches _____ % overall Max. dia. _____ Codominant _____ Included bark
 Broken/Hangers Number _____ Max. dia. _____ Weak attachments _____ Cavity/Nest hole _____ % circ.
 Over-extended branches Previous branch failures _____ Similar branches present
Pruning history
 Crown cleaned Thinned Raised Dead/Missing bark Cankers/Galls/Burls Sapwood damage/decay
 Reduced Topped Lion-tailed Conks Heartwood decay _____
 Flush cuts Other _____ Response growth _____
 Main concern(s) _____

Load on defect N/A Minor Moderate Significant _____
Likelihood of failure Improbable Possible Probable Imminent _____

— Trunk —

Dead/Missing bark Abnormal bark texture/color
 Codominant stems Included bark Cracks
 Sapwood damage/decay Cankers/Galls/Burls Sap ooze
 Lightning damage Heartwood decay Conks/Mushrooms
 Cavity/Nest hole _____ % circ. Depth _____ Poor taper
 Lean _____ ° Corrected? _____
 Response growth _____
 Main concern(s) _____

Load on defect N/A Minor Moderate Significant
Likelihood of failure Improbable Possible Probable Imminent

— Roots and Root Collar —

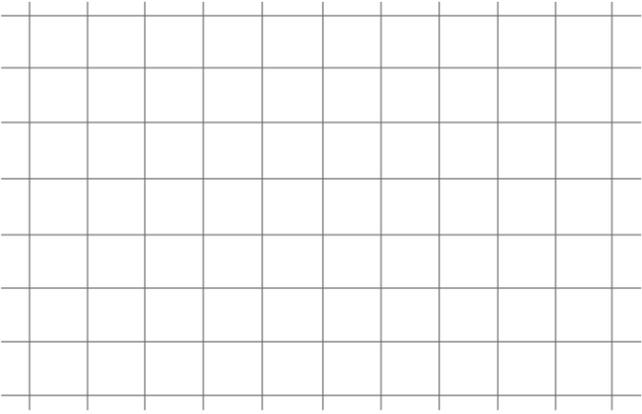
Collar buried/Not visible Depth _____ Stem girdling
 Dead Decay Conks/Mushrooms
 Ooze Cavity _____ % circ.
 Cracks Cut/Damaged roots Distance from trunk _____
 Root plate lifting Soil weakness
 Response growth _____
 Main concern(s) _____

Load on defect N/A Minor Moderate Significant
Likelihood of failure Improbable Possible Probable Imminent

Risk Categorization																							
Condition number	Tree part	Conditions of concern	Part size	Fall distance	Target number	Target protection	Likelihood												Consequences				Risk rating of part (from Matrix 2)
							Failure				Impact				Failure & Impact (from Matrix 1)				Negligible	Minor	Significant	Severe	
							Improbable	Possible	Probable	Imminent	Very low	Low	Medium	High	Unlikely	Somewhat	Likely	Very likely					
1																							
2																							
3																							
4																							

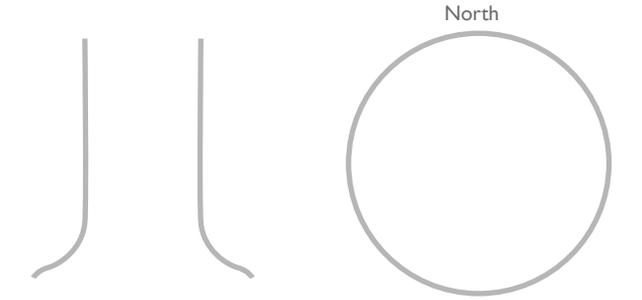
Matrix 1. Likelihood matrix.

Likelihood of Failure	Likelihood of Impacting Target			
	Very low	Low	Medium	High
Imminent	Unlikely	Somewhat likely	Likely	Very likely
Probable	Unlikely	Unlikely	Somewhat likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely



Matrix 2. Risk rating matrix.

Likelihood of Failure & Impact	Consequences of Failure			
	Negligible	Minor	Significant	Severe
Very likely	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



Notes, explanations, descriptions _____

Mitigation options _____ Residual risk _____
 _____ Residual risk _____
 _____ Residual risk _____
 _____ Residual risk _____

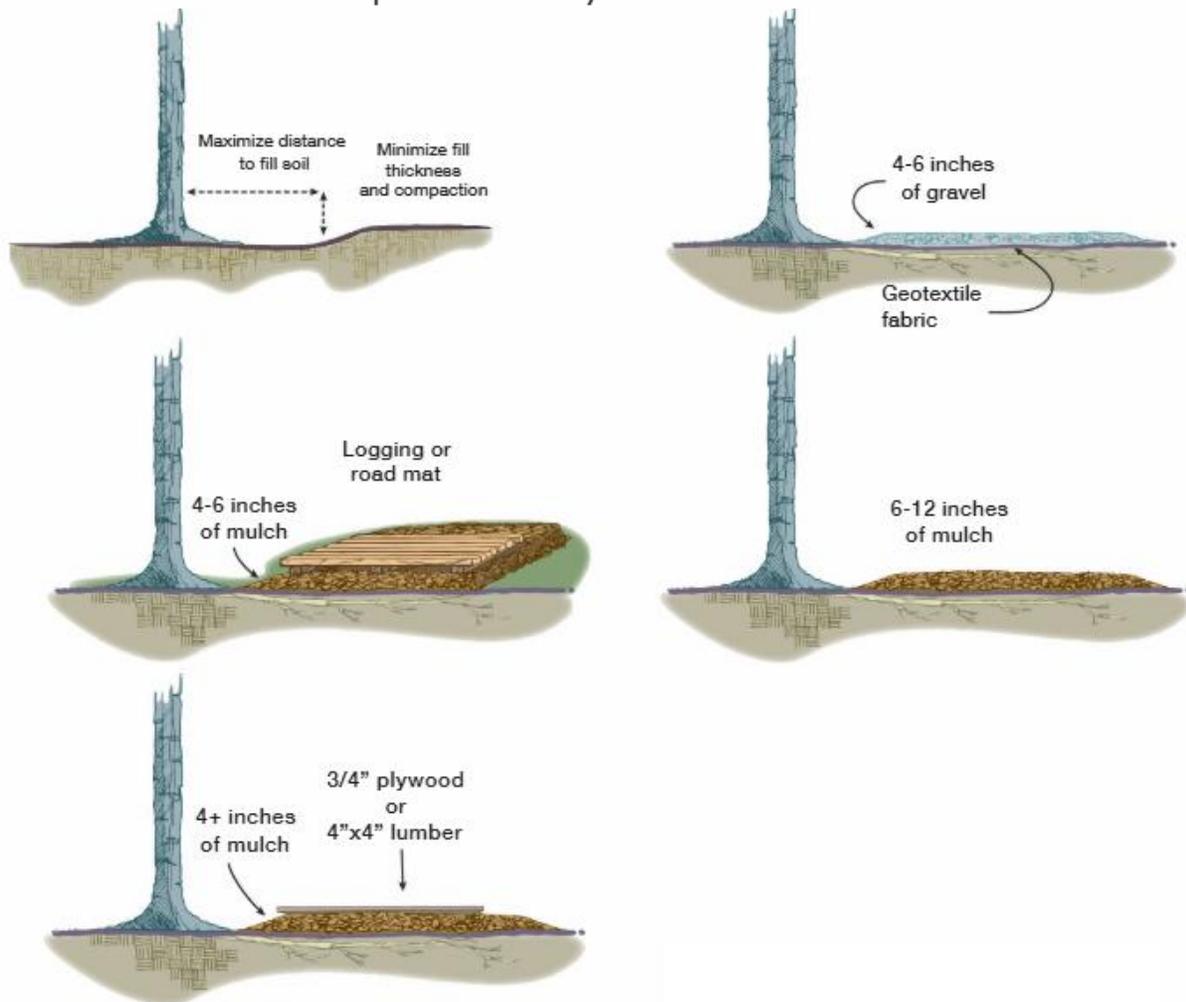
Overall tree risk rating Low Moderate High Extreme Work priority 1 2 3 4
 Overall residual risk Low Moderate High Extreme Recommended inspection interval _____
 Data Final Preliminary Advanced assessment needed No Yes-Type/Reason _____
 Inspection limitations None Visibility Access Vines Root collar buried Describe _____

Soil and Root Protection

When additional soil or root protection is needed inside or outside the TPZ, actions can be taken to distribute the load, minimizing soil compaction and mechanical root damage (Figure 13). These treatments include:

- Applying 6 to 12 in (15 to 30 cm) of arborist wood chip mulch to the area
- Laying logging or road mat, load-bearing steel road plate, 0.75 in (2 cm) minimum thickness plywood, or beams over a 4+ in (10+ cm) thick layer of arborist wood chip mulch
- Applying 4 to 6 in (10 to 15 cm) of gravel with or without a cellular confinement web over a taut, staked, geotextile fabric. Gravel should not be applied directly over the soil surface because it will mix with the topsoil and be difficult to remove without damaging roots. (least preferred method)

Root protection materials will likely need to be removed at the end of the construction phase. Care must be taken to avoid scraping the soil and roots below during the removal operation. Wood chip mulches will break down and be incorporated into the soil if left on the soil surface; therefore, they do not need to be scraped off in many cases.





Tree and Shrub Planting Guidelines

Bonnie Lee Appleton, Extension Specialist

Susan French, Extension Technician, AREC, Hampton Roads; Virginia Tech

Reviewed by David Close, Consumer Horticulture and Master Gardener Specialist, Horticulture, Virginia Tech

Plant and Site Selection

Select trees and shrubs well-adapted to conditions of individual planting sites. Poorly-sited plants are doomed from the start, no matter how carefully they're planted.

Test soil drainage before planting. Dig a test hole as deep as your planting hole and fill with water. If water drains at a rate of less than one inch per hour, consider installing drainage to carry water away from the planting hole base, or moving or raising the planting site (berm construction).

Also consider using more water-tolerant species. For trees, try red maple, sycamore, bald cypress, willow oak, or river birch. For shrubs, try inkberry, redbud, dogwood and buttonbush. Avoid dogwoods, azaleas, boxwoods, Japanese hollies, and other plants that don't like "wet feet" where drainage is poor.

Examine soil for compaction before planting. If soils are compacted, consider replacement with a good loam soil, or incorporation of several inches of an organic material such as composted yard waste to a depth of at least 8 inches over the entire planting area. Do not incorporate small quantities of sand - compaction will increase and drainage decrease.

Site Preparation

Dig shallow planting holes two to three times as wide as the root ball. Wide, shallow holes encourage horizontal root growth that trees and shrubs naturally produce.

In well-drained soil, dig holes as deep as the root ball. In poorly-drained heavy clay soil, dig holes one to two inches shallower than the root ball. Cover the exposed root ball top with mulch.

Don't dig holes deeper than root balls or put loose soil beneath roots because loose soil will compact over time, leaving trees and shrubs planted too deep. Widen holes near

the soil surface where most root growth occurs. Score walls of machine-dug (auger, backhoe) holes to prevent glazing.

Backfill holes with existing unamended soil. Do not incorporate organic matter such as peatmoss into backfill for individual planting holes. Differences in soil pore sizes will be created causing problems with water movement and root growth between the root ball, planting hole, and surrounding soil.

Backfill half the soil, then water thoroughly to settle out air pockets. Finish backfilling, then water again. Cover any exposed root ball tops with mulch.

Incorporate slow-release granular fertilizers into backfill soil to provide nitrogen, or if a soil test indicates a need for phosphorus or potassium. Avoid using fast-release agricultural fertilizers that can dehydrate tree roots. Use no more than 1# actual nitrogen per 1,000 ft. of planting hole surface. (Example - if using 18-6-12 with a 5' diameter hole, incorporate 0.3 oz. per planting hole.)

Tree and Shrub Preparation

Closely inspect the wrapping around root balls of B&B (balled and burlapped) trees and shrubs. Growers use many synthetic materials, as well as burlap treated to retard degradation, to wrap root balls. Many of these materials will not degrade. To insure root growth into surrounding soil, remove pinning nails or rope lacing, then cut away or drop the wrapping material to the bottom of the planting hole, backfilling over it.

Wire baskets used to protect root balls degrade very slowly underground. Remove the top 8-12 inches of wire to keep equipment from getting caught in wire loops, and surface roots from girdling.

Remove all rope, whether jute or nylon, from trunks. Again, degradation is slow or nonexistent, and ropes can girdle trunks and roots.

Remove plastic containers from container-grown trees and shrubs. For plants in fiber pots, break away the top or remove the pot entirely. Many fiber pots are coated to extend their shelf life, but this slows degradation below ground and retards root extension.

If roots are circling around the root ball exterior, cut through the roots in a few places. Cutting helps prevent circling roots from eventually girdling the trunk. Select trees grown in containers with vertical ribs or a copper-treatment on the interior container wall. These container modifications and treatments minimize circling root formation.

Tree Care After Planting

Remove tags and labels from trees and shrubs to prevent girdling branches and trunks.

Good follow-up watering helps promote root growth. Drip irrigation systems and water reservoir devices can facilitate watering.

Mulch, but don't over mulch newly planted trees and shrubs. Two to three inches of mulch is best - less if a fine material, more if coarse. Use either organic mulches (shredded or chunk pine bark, pine straw, composts) or inorganic mulches (volcanic and river rocks).

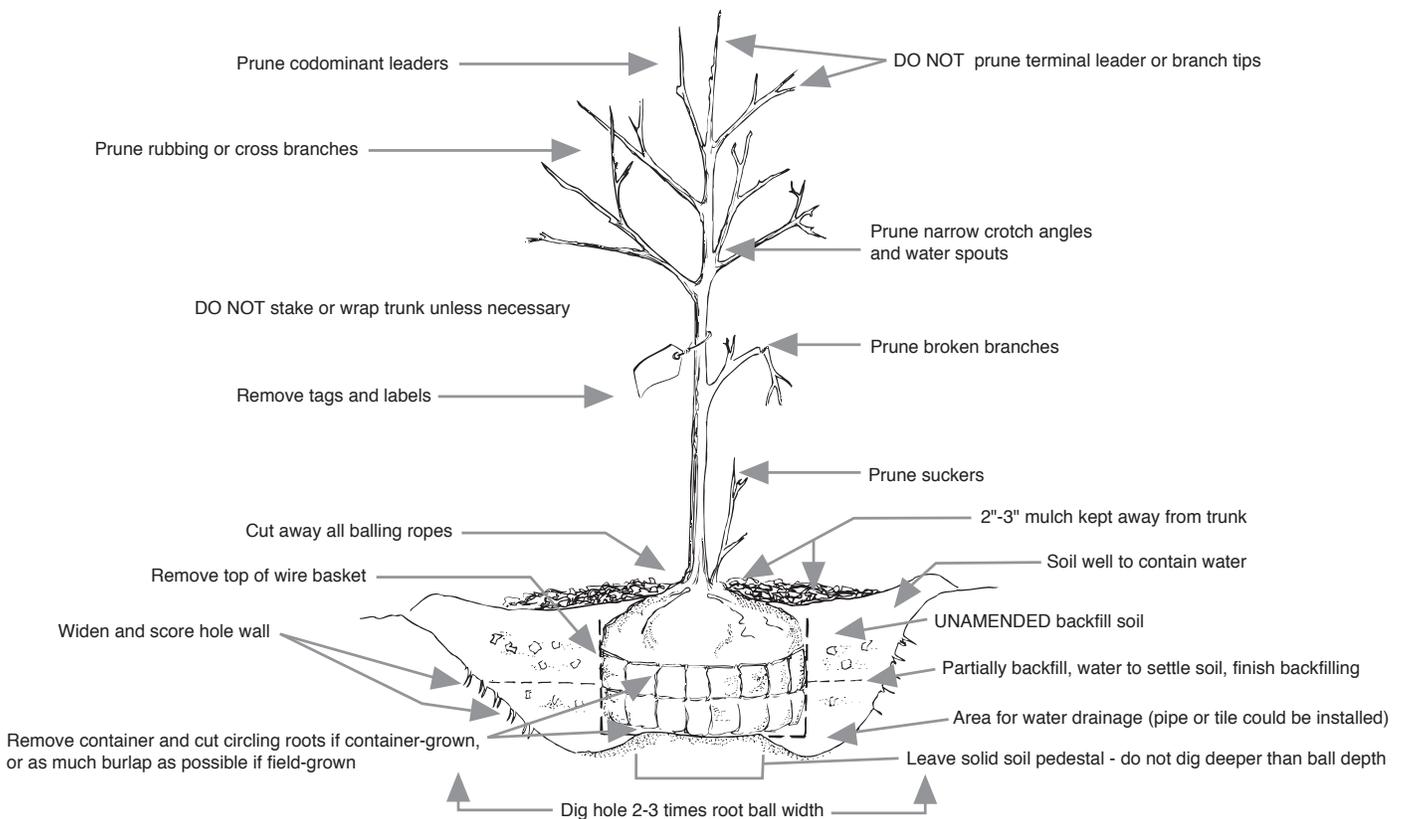
Keep mulch from touching tree trunks and shrub stems. This prevents disease and rodent problems if using organic mulches, and bark abrasion if using inorganic mulches.

Don't use black plastic beneath mulch around trees and shrubs because it blocks air and water exchange. For added weed control, use landscape fabrics that resist weed root penetration. Apply only one to two inches of mulch atop fabrics to prevent weeds from growing in the mulch.

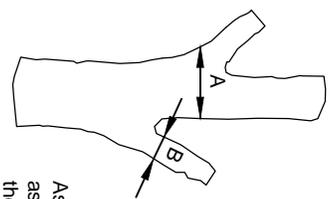
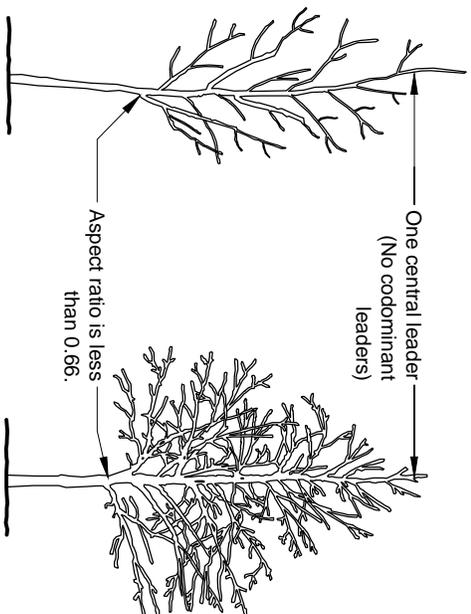
Only stake trees with large crowns, or those situated on windy sites or where people may push them over. Stake for a maximum of one year. Allow trees a slight amount of flex rather than holding them rigidly in place. Use guying or attaching material that won't damage the bark. To prevent trunk girdling, remove all guying material after one year.

Most trees should not have their trunks wrapped. Wrapping often increases insect, disease, and water damage to trunks. Thin-barked trees planted in spring or summer into hot or paved areas may benefit from wrapping if a white wrap is used. To avoid trunk girdling, do not attach wraps with wire, nylon rope, plastic ties, or electrical tape. If wraps must be used, remove within one year.

For protection against animal or equipment damage, install guards to protect the trunk. Be sure the guards are loose-fitting and permit air circulation.

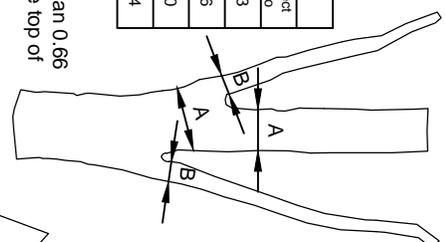


ACCEPTABLE

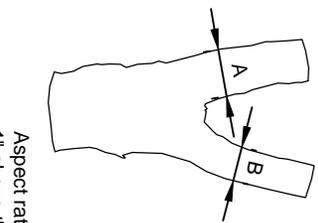
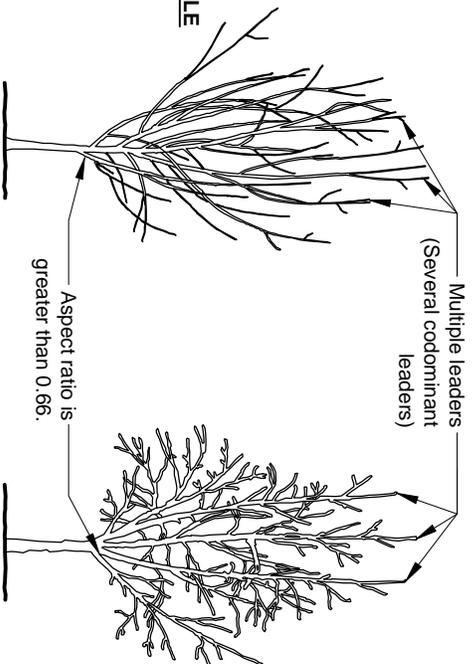


Example		
A	B	Aspect Ratio
1.50"	0.50"	0.33
2.50"	0.90"	0.36
2.0"	1.00"	0.50
2.50"	1.60"	0.64

Aspect ratio of B:A less than 0.66 as measured 1" above the top of the branch union.

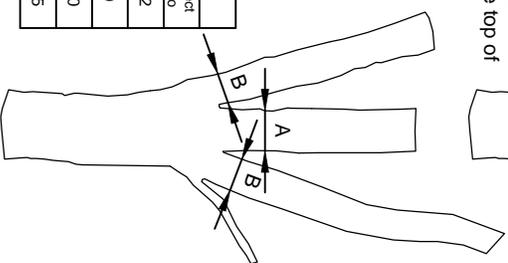


REJECTABLE



Example		
A	B	Aspect Ratio
2.50"	1.80"	0.72
2.0"	2.0"	1.0
2.50"	2.0"	0.80
4.0"	3.0"	0.75

Aspect ratio of B:A greater than or equal to 0.66 as measured 1" above the top of the branch union.



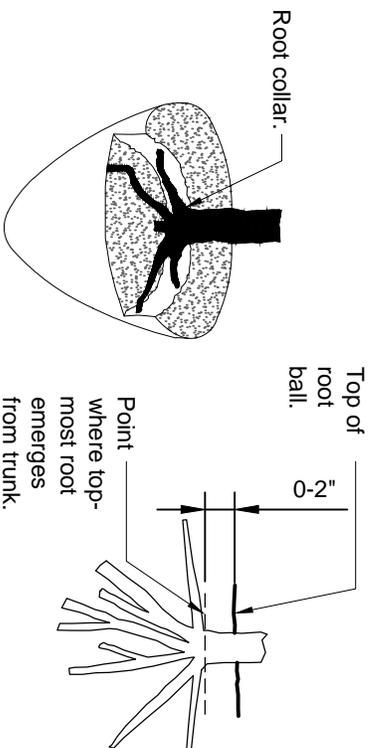
Notes:

- 1- Aspect ratio shall be less than 0.66 on all branch unions. Aspect ratio is the diameter of branch (B) divided by the diameter of the trunk (A) as measured 1" above the top of the branch union.
- 2- Any tree not meeting the crown observations detail may be rejected.

P-X

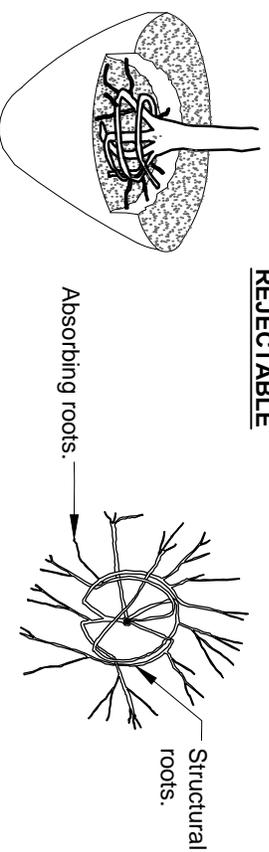
CROWN OBSERVATIONS - HIGH BRANCHED

ACCEPTABLE



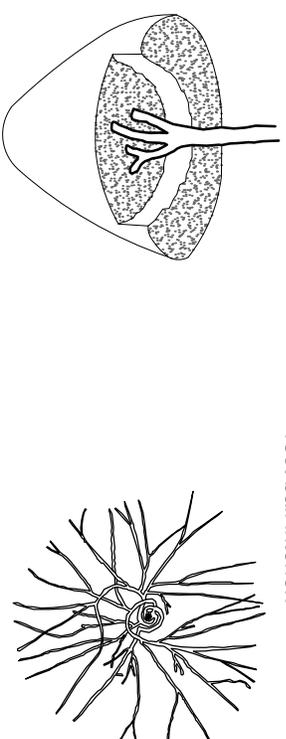
The point where top-most root(s) emerges from the trunk (root collar) should be within the top 2" of substrate. The root collar and the root ball interior should be free of defects including circling, kinked, ascending, and stem girdling roots. Structural roots shall reach the periphery near the top of the root ball.

REJECTABLE



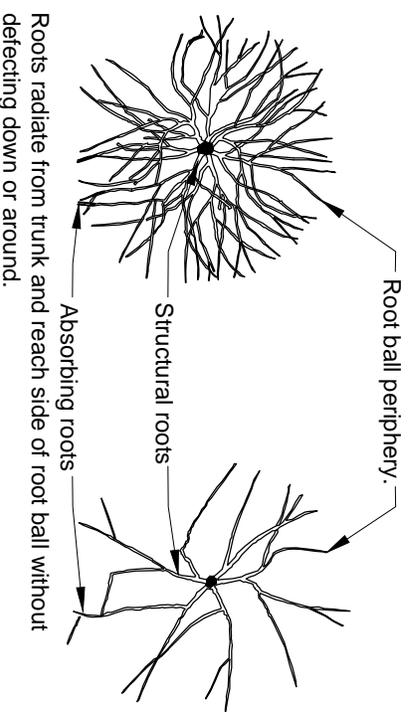
Structural roots circle interior of root ball. No structural roots are horizontal and reach the root ball periphery near the top of the root ball.

Only absorbing roots reach the periphery near the top of the root ball. Structural roots mostly wrap or are deflected on the root ball interior.



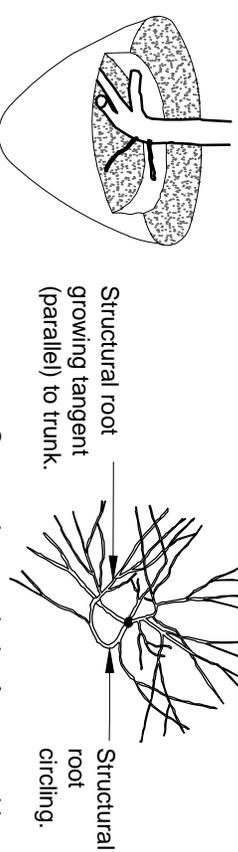
Structural roots descend into root ball interior. No structural roots are horizontal and reach the root ball periphery near the top of the root ball.

Structural roots circle and do not radiate from the trunk.



Structural roots primarily grow to one side.

Structural roots missing from one side, and/or grow tangent to trunk.



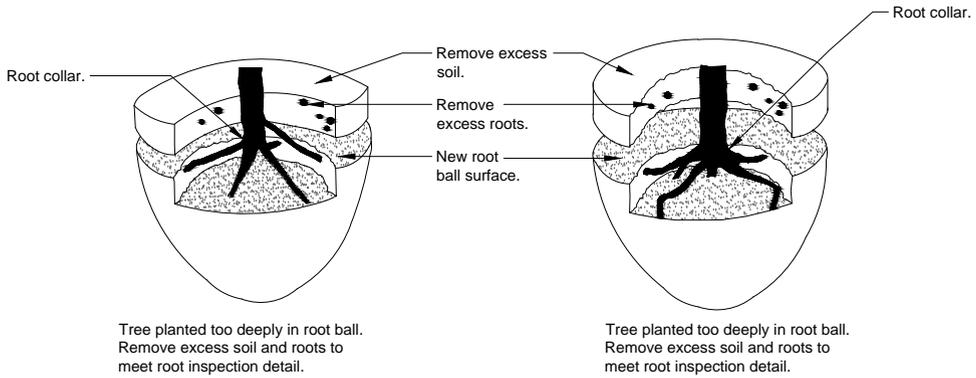
Notes:

1- Observations of roots shall occur prior to acceptance. Roots and soil may be removed during the observation process; substrate/soil shall be replaced after the observations have been completed.

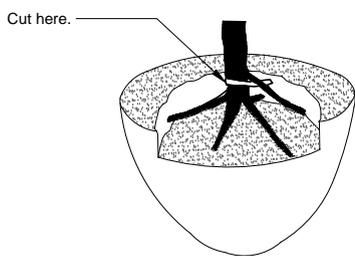
2- See specifications for observation process and requirements.

ROOT OBSERVATIONS DETAIL - BALLED AND BURLAPPED

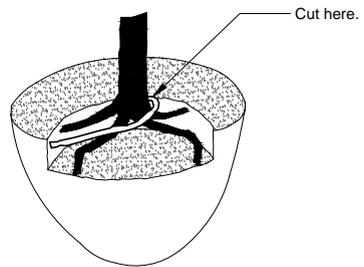
Step 1 - Remove soil and roots over the root collar.



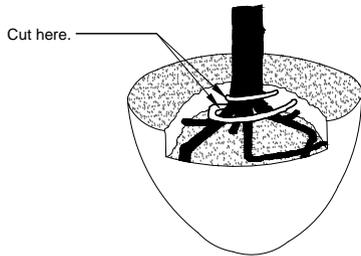
Step 2 - Remove defects.



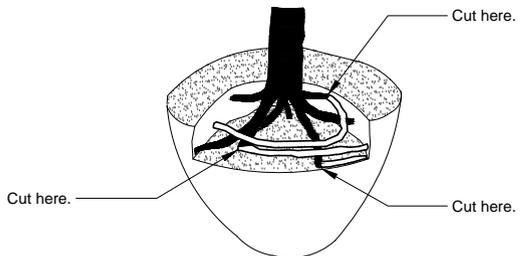
Five structural (large) roots shown in black. Remove structural (white) root wrapping root collar.



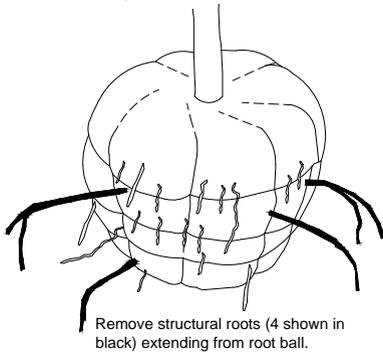
Four structural roots shown in black. Remove root (white) growing over structural roots.



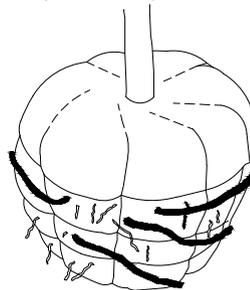
Six structural roots shown in black. Remove structural roots (white) growing over root collar by cutting them just before they make an abrupt turn.



Seven structural roots shown in black. Remove structural roots (white) growing around or over root collar by cutting them just before they make an abrupt turn.



Remove structural roots (4 shown in black) extending from root ball.

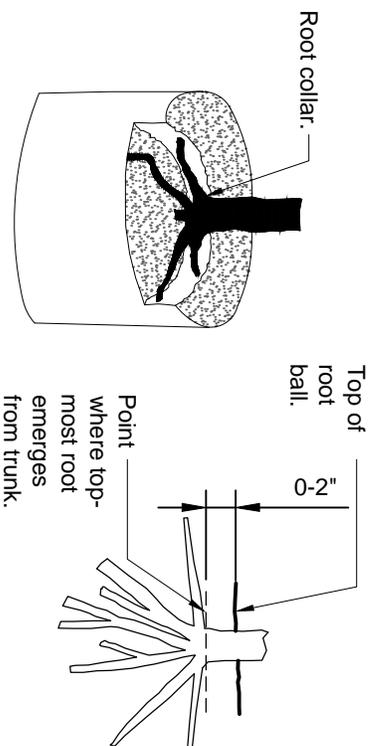


Remove structural roots (4 shown in black) deflected on root ball periphery. Small roots ($\frac{1}{4}$ " or less) at the periphery of the root ball are not defined as defects and do not need to be removed.

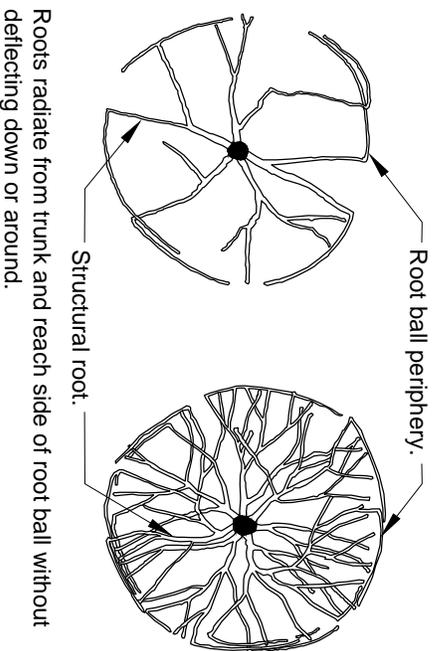
Notes:

- 1- All trees shown are rejectable unless they undergo recommended correction.
- 2- First step 1, then step 2. Adjust hole depth to allow for the removal of excess soil and roots over the root collar.
- 3- Roots and soil may be removed during the correction process; substrate/soil shall be replaced after the correction has been completed.
- 4- Trees shall pass root observations detail following correction.

ACCEPTABLE

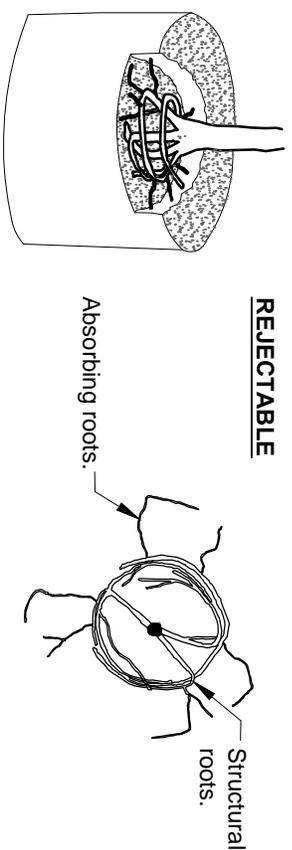


The point where top-most root(s) emerges from the trunk (root collar) should be within the top 2" of substrate. The root collar and the root ball interior should be free of defects including circling, kinked, ascending, and stem girdling roots. Structural roots shall reach the periphery near the top of the root ball.

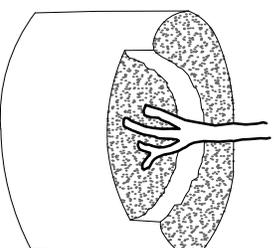


Roots radiate from trunk and reach side of root ball without deflecting down or around.

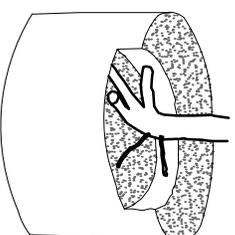
REJECTABLE



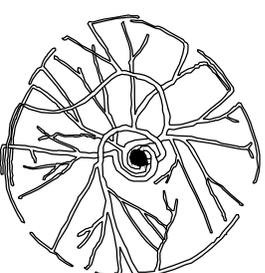
Structural roots circle interior of root ball. No structural roots are horizontal and reach the root ball periphery near the top of the root ball.



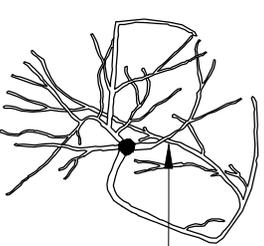
Structural roots descend into root ball interior. No structural roots are horizontal and reach the root ball periphery near the top of the root ball.



Structural roots primarily grow to one side.



Structural roots circle and do not radiate from the trunk.



Roots growing tangent to trunk.

Structural roots missing from one side, and/or grow tangent to trunk.

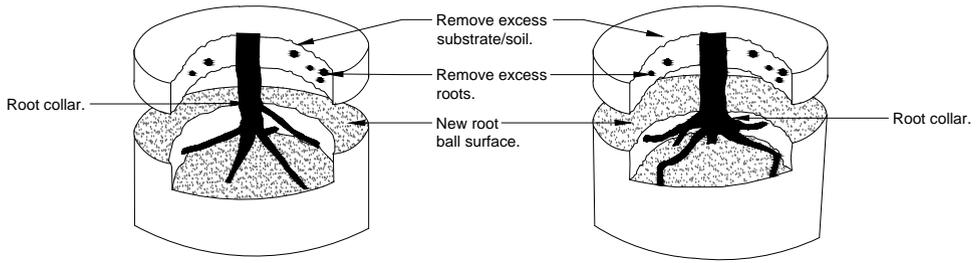
Notes:

- 1- Observations of roots shall occur prior to acceptance. Roots and substrate may be removed during the observation process; substrate/soil shall be replaced after observation has been completed.
- 2- Small roots ($\frac{1}{4}$ " or less) that grow around, up, or down the root ball periphery are considered a normal condition in container production and are acceptable however they should be eliminated at the time of planting. Roots on the periphery can be removed at the time of planting. (See root ball shaving container detail).
- 3- See specifications for observation process and requirements.

P-X

ROOT OBSERVATIONS DETAIL - CONTAINER

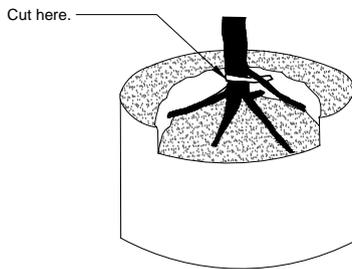
Step 1 - Remove substrate over root collar.



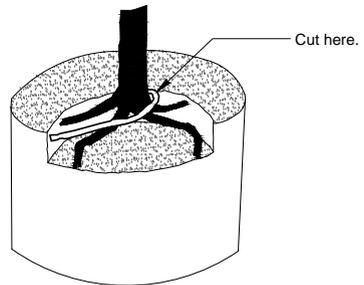
Tree planted too deeply in root ball. Remove excess substrate and roots to meet root inspection detail.

Tree planted too deeply in root ball. Remove excess substrate and roots to meet root inspection detail.

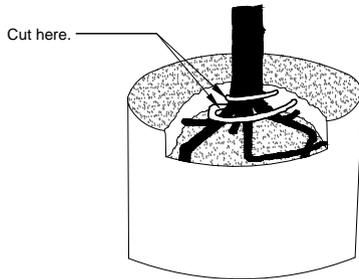
Step 2 - Remove defects.



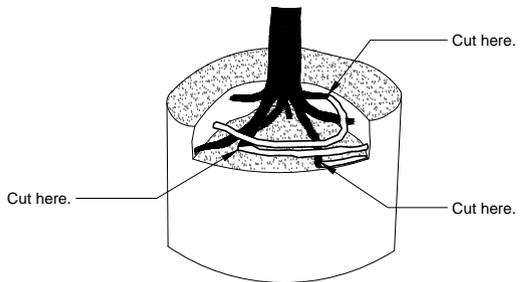
Five structural (large) roots shown in black. Remove structural root (white) wrapping root collar.



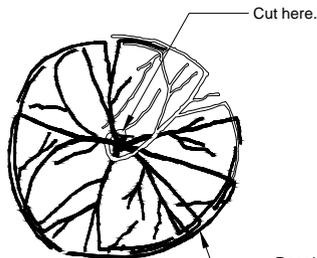
Four structural roots shown in black. Remove root (white) growing over structural roots.



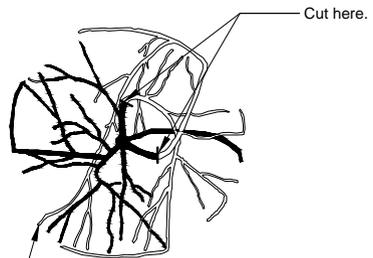
Six structural roots shown in black. Remove roots (white) growing over root collar by cutting them just before they make an abrupt turn.



Seven structural roots shown in black. Remove structural roots (white) growing around or over root collar by cutting them just before they make an abrupt turn.



Cut structural root just before it makes abrupt turn. Pruning cut should be made tangent (parallel) to the trunk.

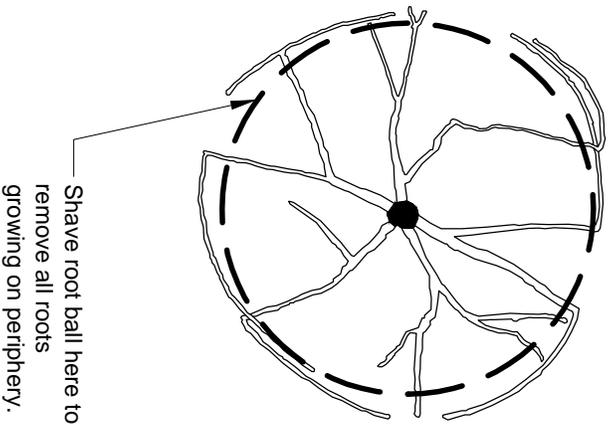


Cut structural roots just before they make abrupt turn by cutting tangent (parallel) to the trunk (two cuts shown).

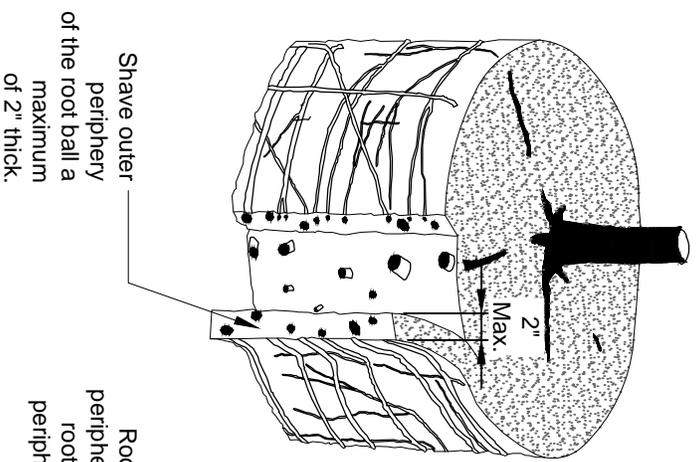
Notes:

- 1- All trees shown are rejectable unless they undergo recommended correction.
- 2- First Step 1, then Step 2. Roots and soil may be removed during the correction process; substrate/soil shall be replaced after correction has been completed.
- 3- Trees shall meet root observations detail following correction.
- 4- Small roots (1/4" or less) on the periphery of the root ball are common with container plant production. These small roots are not defined as "defects" and can be addressed at the time of installation (See root ball shaving container detail).

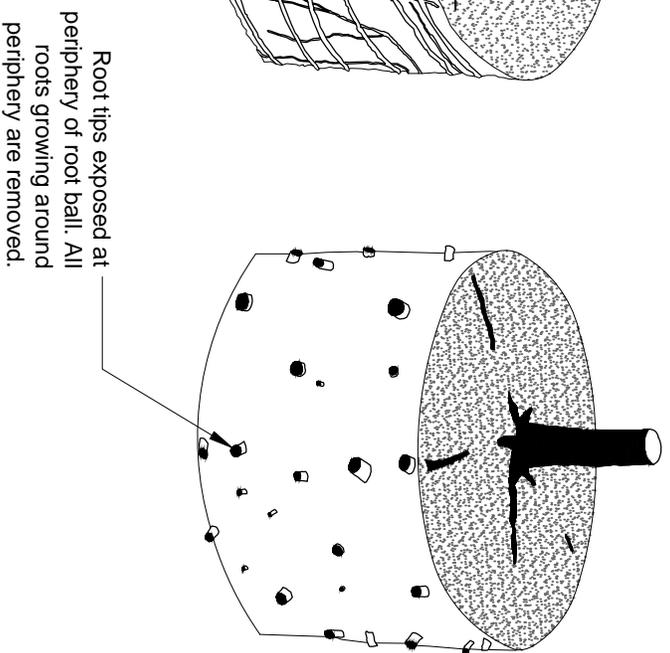
BEFORE SHAVING



SHAVING PROCESS



SHAVING COMPLETE

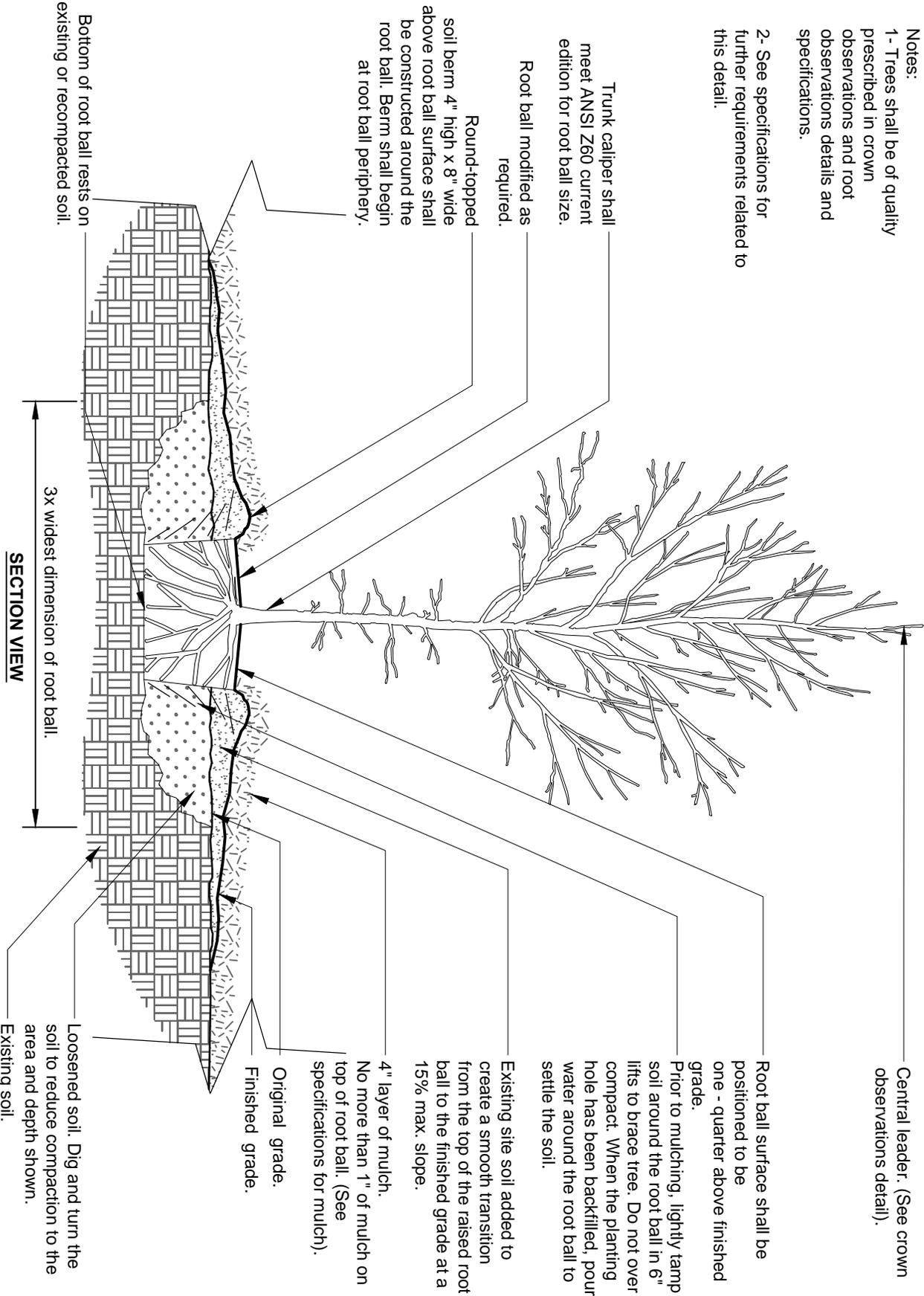


Notes:

- 1- Shaving to be conducted using a sharp blade or hand saw eliminating no more than needed to remove all roots on the periphery of root ball.
- 2- Shaving can be performed just prior to planting or after placing in the hole.

Notes:
 1 - Trees shall be of quality prescribed in crown observations and root specifications details and specifications.

2 - See specifications for further requirements related to this detail.



TREE IN POORLY DRAINED SOIL

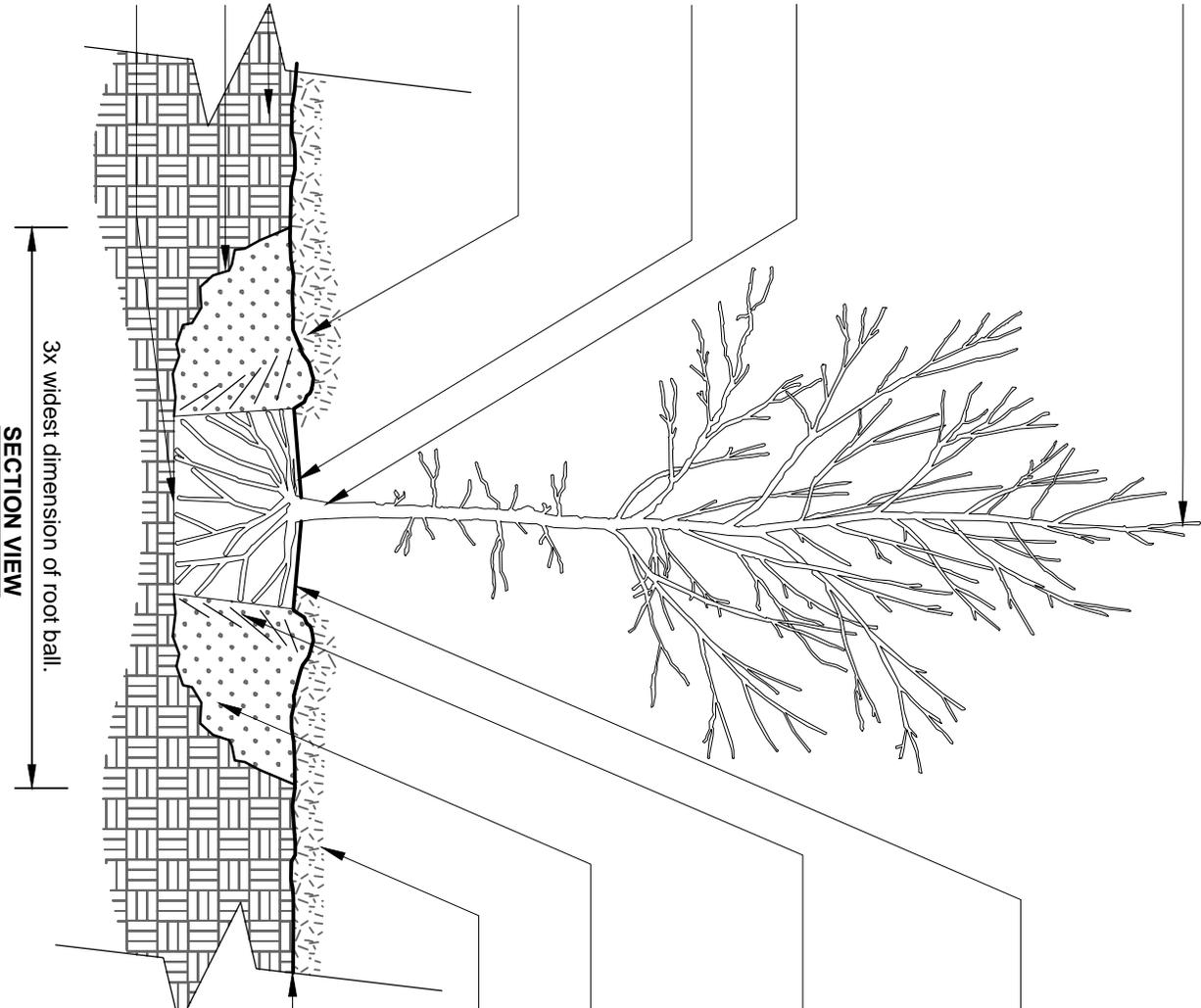
P-X

Central leader. (See crown observations detail).

Trunk caliper shall meet ANSI Z60 current edition for root ball size.
Root ball modified as required.

Round-topped soil berm 4" high x 8" wide above root ball surface shall be constructed around the root ball. Berm shall begin at root ball periphery.

Existing soil
Slope sides of loosened soil.
Bottom of root ball rests on existing or recompacted soil.



Top of root ball shall be flush with finished grade.

Prior to mulching, lightly tamp soil around the root ball in 6" lifts to brace tree. Do not over compact. When the planting hole has been backfilled, pour water around the root ball to settle the soil.

Loosened soil. Dig and turn the soil to reduce compaction to the area and depth shown.

4" layer of mulch. No more than 1" of mulch on top of root ball. (See specifications for mulch).

Finished grade.

Notes:
1- Trees shall be of quality prescribed in crown observations and root observations details and specifications.

2- See specifications for further requirements related to this detail.

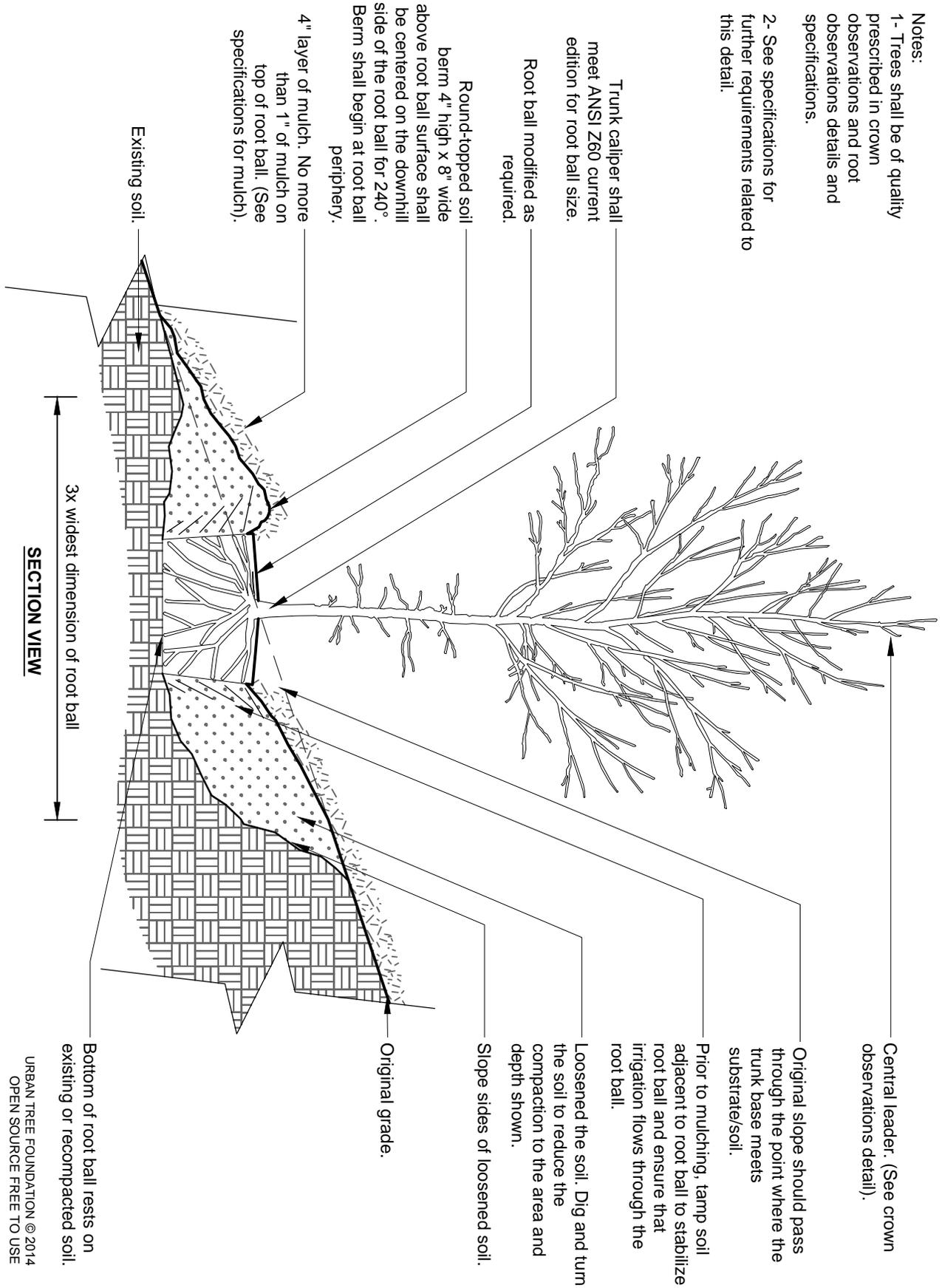
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TREE W/ BERM (EXISTING SOIL NOT MODIFIED)

P-X

Notes:
 1- Trees shall be of quality prescribed in crown observations and root observations details and specifications.

2- See specifications for further requirements related to this detail.



Central leader. (See crown observations detail).

Original slope should pass through the point where the trunk base meets substrate/soil.

Prior to mulching, tamp soil adjacent to root ball to stabilize root ball and ensure that irrigation flows through the root ball.

Loosened the soil. Dig and turn the soil to reduce the compaction to the area and depth shown.

Slope sides of loosened soil.

Original grade.

4" layer of mulch. No more than 1" of mulch on top of root ball. (See specifications for mulch).

Trunk caliper shall meet ANSI Z60 current edition for root ball size.
 Root ball modified as required.

Round-topped soil berm 4" high x 8" wide above root ball surface shall be centered on the downhill side of the root ball for 240°. Berm shall begin at root ball periphery.

Bottom of root ball rests on existing or recompacted soil.

SECTION VIEW

3x widest dimension of root ball

Existing soil.

TREE ON SLOPE 5% (20:1) TO 50% (2:1) - UNMODIFIED SOIL

P-X