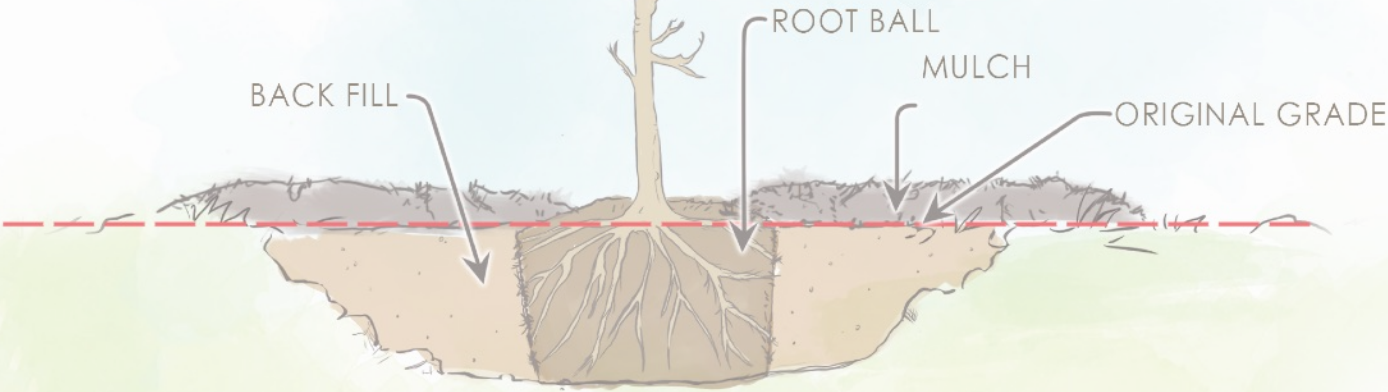


TREE AND SHRUB PLANTING SPECIFICATIONS FOR NORTHEASTERN COMMUNITIES

2021 REVISION





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INTRODUCTION

1.1 While there are often numerous landscape contractors available within any given geographic market, it is important to find those contractors that follow proper cultural practices, industry standards and horticultural guidelines. The substandard craftsmanship of many otherwise honest and hardworking contractors can lead to the detriment of urban forest, hinder the natural appreciation of values over time and result in many thousands of dollars of lost investments and inflated maintenance costs. Therefore, it is highly recommended to hire only those contractors who agree in writing to adhere to American National Standard Institute (ANSI) standards and industry best management practices.

1.2 Trees and shrubs of significant size represent a substantial investment to communities. When installed improperly, woody plants may not grow, or grow very poorly for many years before succumbing to secondary agents to which healthy specimens would have natural resistance. In other cases, poorly planted trees and shrubs may become problematic, requiring excessive pest management, watering or pruning before ultimately becoming too hazardous or unsightly to maintain. When multiplied by hundreds or thousands of plants within a community, the excess maintenance and replacement costs can be exorbitant and result in long-term costs instead of returns or substantially reduced returns.

PURPOSE AND USE OF THE DOCUMENT

1.3 The purpose of this document is to provide work specifications for homeowner associations, communities, townships, property managers or anyone who may have planting projects involving numerous arboreal plants.

1.4 This document is intended to be used as a guide for bid specifications, work procedures and quality control involving the planting of trees and shrubs.

LIMITATIONS OF THE DOCUMENT

1.5 This document is not intended to be all-inclusive and does not replace the need for quality control by a qualified consulting arborist or landscape professional. There are many aspects to tree planting, from species/site selection and individual plant selection to transportation and physical planting that can have profound impacts on the long-term viability of trees and shrubs.

1.6 These specifications only address **balled and burlapped**¹ trees (B&B), the most common type of nursery stock available to the region.

¹ Definitions for terms in **Bold** can be found in the Glossary section on Page 10

1.7 As each topic introduced in these specifications is worthy of at least a chapter in a textbook, forgoing inclusion of any section for the purpose of cost containment will likely result in disproportionately higher maintenance and replacement costs in the future.

1.8 The user of this document does so free of charge and at their own risk. The author of this document assumes no liability for the use or misuse of this document. Further, the author expressly disclaims responsibility or liability for any loss, damage, injury or other liability whatsoever arising or resulting from reliance on the information contained in this document.

PLANNING

2.1 All sites chosen for planting shall be inspected for species suitability and long term viability. Factors to consider include:

- Sun exposure
- Wind exposure
- Rainwater runoff
- Soil physical properties (drainage)
- Soil analysis (pH and chemical properties)
- Overhead and underground utility locations
- Physical space within the landscape (i.e. conflict with infrastructure, traffic sight-lines, traffic control devices, sign clearances, etc.)
- Physical characteristics of the tree(s) (i.e. fruiting, high failure potential, allergenic reactions)
- Pathogenic pressures (local insect and disease presence and susceptibility)

2.2 Additionally, there are other site-specific limitations that should be considered prior to plant selection and installation. These can include appropriate access for required equipment and personnel for the installation project, after-planting care and future maintenance. Locations for staging of plant material in a manner that does not harm the landscape nor disrupt the regular activities of residents (e.g., traffic flow, parking, playgrounds, etc.) should also be considered.

PLANT MATERIAL

3.1 All plant material for a project shall be specified by species, **cultivar** or **variety**, size and planting locations. Unless explicitly stipulated otherwise, all plant material required by a project shall be obtained and transported by the contractor. Unless under the supervision of an independent consulting arborist or landscape professional, the contractor shall ensure all plant material is in compliance with the current ANSI Z60.1 standard for nursery stock.

3.1.1 It should be noted that there is an exponential increase in the cost of plant material in relation to size. This is the obvious result of the disproportionate difficulty factors related to larger trees. For example, a tree with a 20 inch root ball may weigh over 250 pounds, yet a tree with a 40 inch rootball will weigh closer to 1,800 pounds. However, the value or benefits of these larger plantings often do not parallel their increase in cost. Immediate utility requirements of the trees should be carefully considered against the exponential increase in costs. For example, a memorial grove that is to attract immediate visitors may warrant a relatively small number of significantly sized specimens as compared to a community street-tree program.

3.2 As any number of defects can work their way into the supply chain and cause issues for the community years later, the contractor shall make every effort to obtain plant material of sufficient quality so as to ensure longevity. The contractor should develop his or her own checklist for the inspection of plant material prior to loading at the nursery. An independent consulting arborist or landscape professional should be contracted to approve plant quality prior to installation. It will be the duty of the contractor to replace any plant material rejected by the consulting arborist or landscape professional. Examples of common defects include, but are not limited to the following:

- Damaged and or bleeding areas on bark
- Large dead branches (branches that are $\geq 1/3$ the diameter of the parent)
- Row run (excessive asymmetrical growth)
- Pest or disease populations capable of impacting plant physiology
- Undersized, oversized, soft, broken or crumbling **root balls**
- Embedded twine, wrapping material, or baskets
- Multiple stems with **bark inclusions** (especially where excurrent trees are specified)
- Absent **root flares** or **circling roots**

3.3 The contractor shall take every reasonable precaution during the loading, securing, transportation, unloading and handling of all plant material. All plant material should be loaded, secured, unloaded and moved onsite using non-destructive methods (i.e., root balls, trunks and branches should not show signs of harm). If plant material is to be transported more than five (5) miles, then mesh tarps must be used to prevent foliar damage and desiccation from wind.

3.4 Upon request, the contractor shall allow access to any and all project plant material for the purpose of quality inspection by an independent consulting arborist or landscape professional of the community's choosing. Should the independent consultant reject any plant material, it will be the contractor's responsibility to return or dispose of said plant material and replace it with material of adequate quality. In cases where plant material was rejected by the independent consultant, the consultant shall document the plant species, size and reason(s) for rejection.

JOBSITE MANAGEMENT

4.1 Prior to engaging in work activity, the contractor shall put forth effort to identify hazards, obstacles and/or conflicts with the project plan. This includes contacting local utilities or “one-call” system to find and mark the locations of any underground utilities in proximity to planting sites prior to digging. The contractor shall also attempt to identify, locate and avoid hidden obstacles such as low-voltage landscape lighting and irrigation components.

4.2 The contractor shall take every precaution to prevent damage to surrounding landscape, hardscape and turf. Where applicable, the contractor shall use plywood, construction mats, or other means to protect hardscaping and turf from harmful activity (e.g., equipment access, truck access and/or repetitive access by personnel). When mats are used to protect turf, the contractor shall take precautions not to cause scorching or “burning” of turf in full sun.

4.2.1 Any turf, landscape and/or property damage caused by the contractor in performance of the contract shall be repaired to the satisfaction of the community or its designee prior to completion of the project.

4.3 Offloading and staging of plant material and equipment shall be conducted at a stipulated location on site. This staging area should be away from recreation areas, reasonably close to work areas, and should not interfere with normal day-to-day activities of community residents. The community representative must work with the contractor in determining suitable locations for staging equipment and plant material on site.

4.4 If plant material is to be staged for more than a day, the contractor must consider watering requirements to maintain plant health while material remains unplanted. (Periods of natural rainfall that prevent work completion should be considered adequate for watering purposes.)

4.5 Where staging areas are to be maintained overnight; cones, signs, caution tape or other appropriate marker shall be used to delineate a work zone. If this zone is to be located roadside, then traffic cones with reflective tape must be used to establish a perimeter and protect both workers and normal traffic in the area. Should it become necessary to momentarily breach a roadside work perimeter into the normal flow of traffic, the contractor must have at least one person wearing a high-visibility vest and equipped with an appropriate stop/slow sign to control traffic.

PLANTING METHODS

- 5.1** The contractor shall consider time of year and plant **phenology** prior to installation of plant material to ensure survivability.
- 5.2** The contractor shall use tools and equipment that are appropriate and safe for tasks being performed. Spades, blades and cutting tools shall be kept sharp to reduce excessive damage to plant material.
- 5.3** The contractor shall dig every planting hole according to the size of each root ball that is to be used within the hole as well as soil drainage, slope and site properties. *(See Figures 1-3 beginning on Page 7)* Using a single auger to excavate numerous planting holes is acceptable if each hole meets the minimum dimensions set forth in this document.
- 5.4** The contractor shall make every effort to locate and excavate the trunk flare of each plant being installed. At least two **structural roots** shall be located within the top one to three inches of the surface of root balls.
- 5.6** The depth of each root ball is determined by measuring from the bottom of the root ball to the bottom of the trunk flare. *(Note: This may require the removal of soil from the top of the root ball as indicated in 5.4, above.)*
- 5.7** At no time may the depth of a planting hole exceed the depth of the root ball or the trunk flare of the plant being installed.
- 5.8** In common or well-drained soils, the contractor shall excavate planting holes at least 1.5 times the diameter of the root ball that is to be installed in the hole. In highly compacted soil, the planting hole diameter should be two times the diameter of the root ball. (See Figure 1)
- 5.9** In poorly drained soils, the contractor shall excavate planting holes at least three times the diameter of the root ball that is to be installed in the hole. The depth of the planting hole shall allow for 1/4 to 1/3 of the root ball to remain above the original grade. Backfill soil shall form a berm at the periphery of the root ball and slope away from the root ball gradually. (See Figure 2) Efforts to improve drainage and select species tolerant of poor drainage shall be considered prior to planting.

5.10 When planting on a slope, hill or other uneven grade, the contractor shall make adjustments to the width and depth of the planting hole to compensate for the grade. The final planting depth shall result in the original grade passing through the bottom of the trunk flare. A soil berm shall be established on the lowest side of the planting hole near the periphery of the root ball and gradually transition into the natural grade. (See Figure 3)

5.11 Upon stabilizing the root ball within the planting hole and prior to backfilling more than half, the contractor shall untie and remove all wrapping material and twine from the trunk and top 1/3 of the root ball. If older style wire baskets that overlap the top of the root ball were used, the contractor shall cut and remove the top 1/3 of the wire basket along with the burlap and twine. Newer style low profile baskets that do not reach the top of the root ball do not need to be cut or removed.

5.12 Backfill soil shall consist of no less than 90% of the original native soil. After backfilling the planting holes, the contractor will supply and install quality organic mulch.

5.13 Where wind-throw or excessive shifting is a concern, the contractor shall use a minimum of two tree stakes or guys. One stake shall be located windward and one stake shall be located leeward. Each stake shall be driven into the ground near the periphery or outside the planting hole deep enough to offer anchorage. Wide straps, hoses to cover wire or padding shall be used at the point(s) of attachment to prevent damage to bark. Guys used shall be loose enough to allow for some natural movement and be made of a material that does not damage the bark of the tree(s).

5.14 Where supports are utilized, the contractor shall inspect trees at least one time during the first growing season to ensure that supports are not damaging trees and make any needed adjustments. Support systems shall be removed as soon as it is determined that the trees are established enough to support themselves (usually not more than one or two seasons).

5.15 Where frost cracks, sun-scalding, deer-rubbing, or other bark damage are of concern, the contractor shall protect the trunks of trees with the appropriate material. These materials can consist of plastic wraps, paper or temporary deer fence. Regardless of the chosen material, the trunk protection shall allow for trunk movement and tree growth without damage.

5.16 Trunk protection should be removed after trees are established enough for their environment and before wrapping material becomes constrictive.

5.17 Where trunk protection is needed for a number of years, periodic inspections and adjustments to protective materials should be made to prevent girdling the **stem** and integrity of the protection.

POST PLANTING CARE

6.1 Upon completion of the planting process, the contractor shall prune the **crowns** of trees to remove any dead or broken branches only. All pruning cuts, tools and methods shall be in compliance with ANSI A300 (Part 1).

6.2 Prior to leaving the site, the contractor shall water all trees and shrubs until the soil surrounding each planting site reaches **field capacity**.

6.3 The contractor, at the supervision or direction of the consulting arborist or landscape professional, shall continue to monitor and manage pests, irrigation and support systems of all newly planted material for a period of one year. Maintenance thereafter will be by a contract to be agreed upon by both parties.

WARRANTY

7.1 It shall be the duty of the contractor to guarantee the survivability of all plant material for a period of one year. This guarantee shall not be extended to events such as fire, flood, vandalism, extreme weather, terrorist attacks, affliction by previously unknown invasive insects or pathogens, or any other cause of death or decline outside of the reasonable control of the contractor.

7.2 Should it be determined that the loss of plant material was reasonably preventable through appropriate plant material selection, planting methods or post planting care, it shall be the duty of the contractor to replace the lost plant material at the next available planting window (spring or fall).

7.3 The threshold for loss and replacement of plant material shall be when one or more of the following occurs:

- a) 40 percent or more of the trunk bark circumference of a single-stemmed tree is lost;
- b) The central stem of a single stemmed tree declines 30 percent or more;
- c) The loss of the primary stem or 30 percent or more of ancillary/codominant stems of a multi-stemmed tree; and
- d) 40 percent or more dieback of the entire crown (no active chlorophyll remains in twigs).

7.4 Cause and extent of decline or death of one or more plants shall be determined by an independent consulting arborist or landscape professional.

FIGURE 1: PLANTING IN COMMON SOIL



TREE PLANTING IN NORMAL CONDITIONS

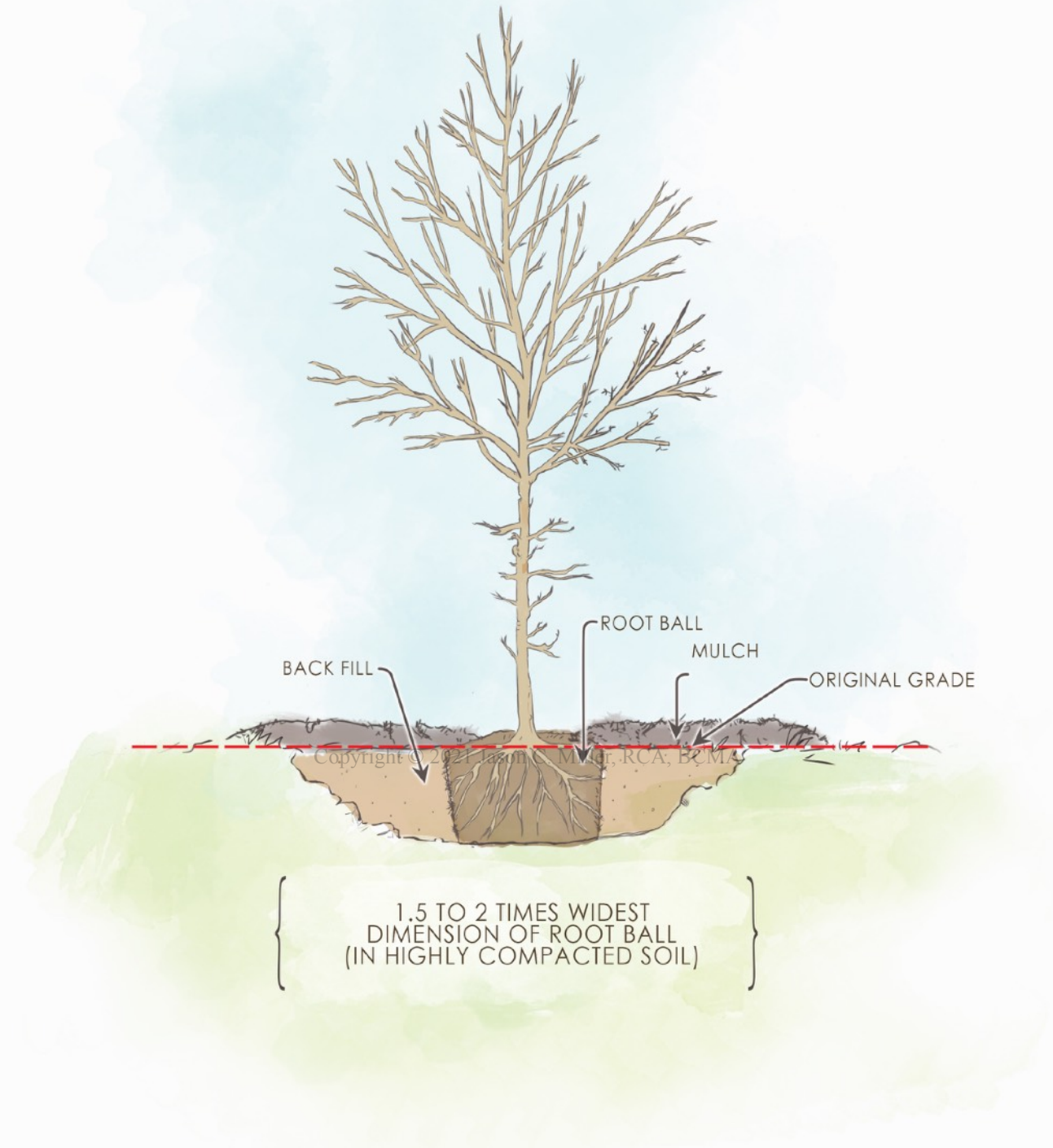


FIGURE 2: PLANTING IN POORLY DRAINED SOIL

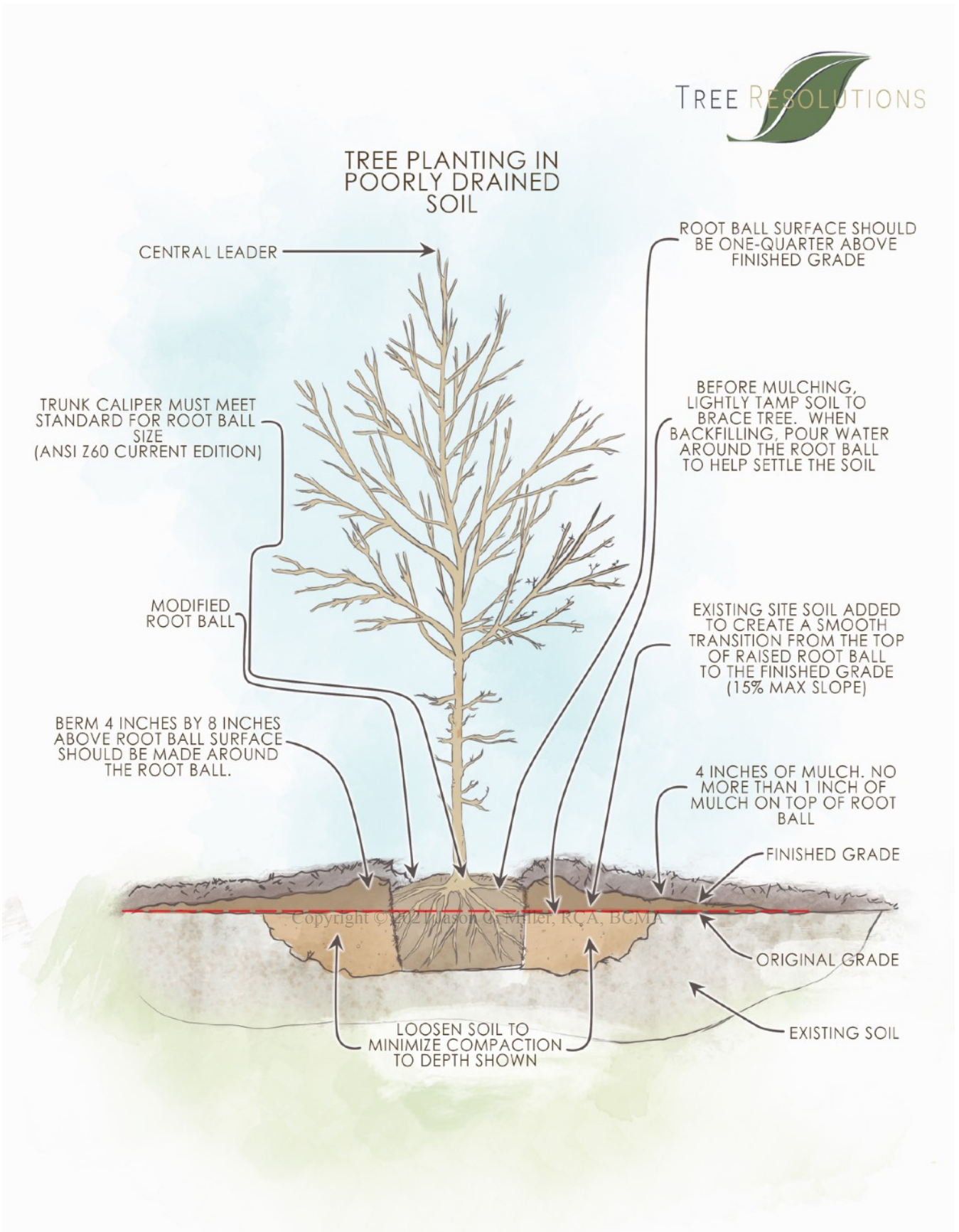
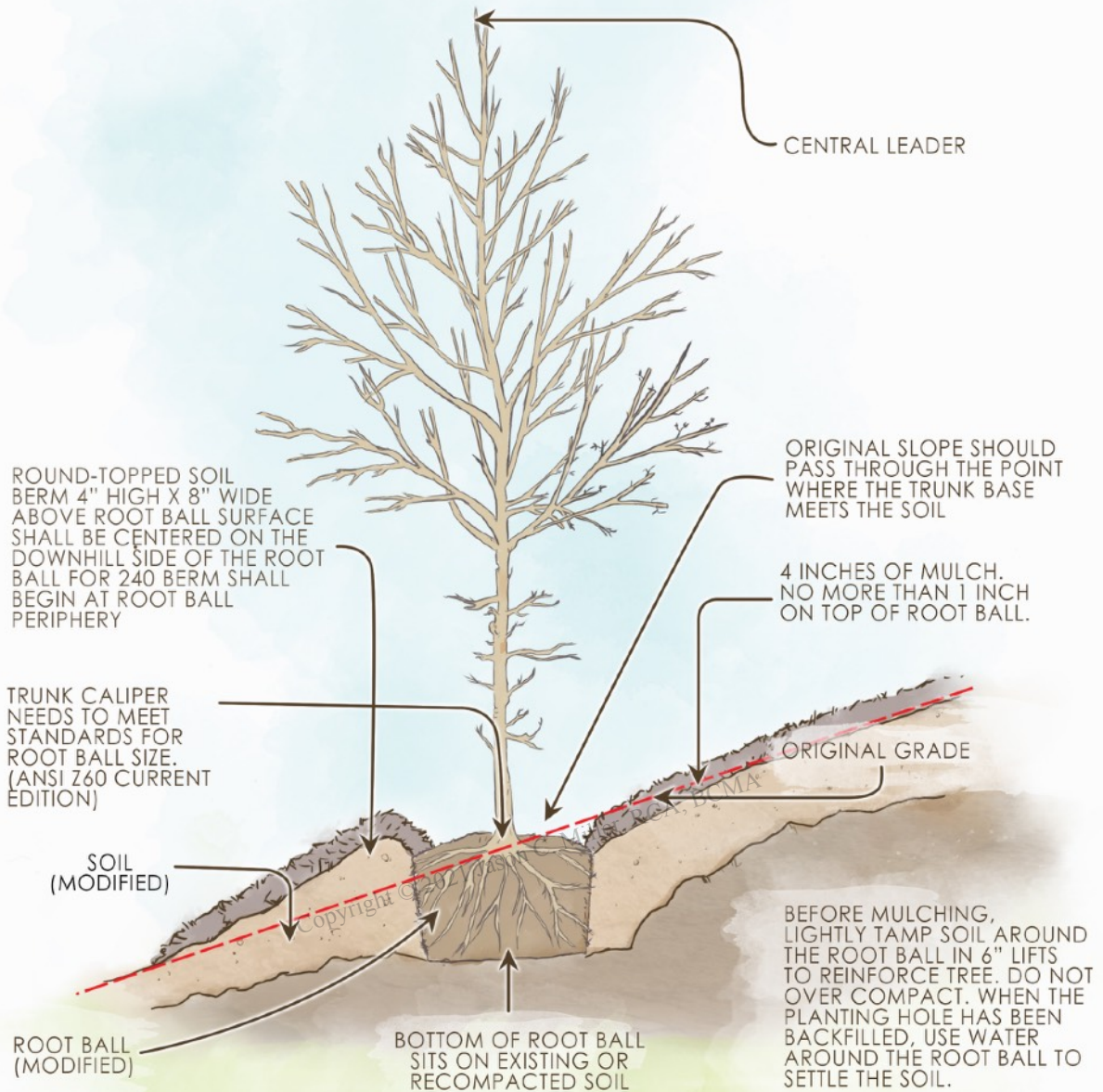


FIGURE 3: PLANTING ON A SLOPE



TREE PLANTING ON SLOPE (EXISTING SOIL MODIFIED)



GLOSSARY

BALLED AND BURLAPPED	Tree or other plant dug and remove from the ground for transplanting, with the root and soil wrapped in burlap or a burlap-like fabric.
BARK INCLUSIONS (ALSO: INCLUDED BARK)	Bark that becomes embedded in the union between branch and trunk or between codominant stems. Lacks wood connections, resulting in a weak structure.
CODOMINANT STEMS	Forked stems or branches of nearly the same diameter, lacking a branch collar and arising from a common union. (Often resulting in bark inclusions.)
CIRCLING ROOTS	Roots that grow in a circular pattern when a plant is confined in the same container longer than necessary
CROWN	Upper part of a tree, measured from the lowest branch, including all the branches and foliage.
CULTIVAR	Cultivated variety of a species that cannot be reproduced without human assistance.
FIELD CAPACITY	Maximum soil moisture content following the drainage of water due to the force of gravity.
PHENOLOGY	Relationship between the climate and biological events, such as flowering or leafing out in plants.
STEM	Woody structure bearing foliage and buds that gives rise to other stems (branches).
STRUCTURAL ROOTS	Large, woody, tree roots that anchor and support the trunk and crown; roots characterized by secondary thickening and relatively large diameter giving form to the root system and functioning in anchorage and support.
VARIETY	Naturally occurring subdivision of a species having a distinct difference and breeding true to that difference.

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