Sherby Sanborn Consulting Arborist

ISA Certified Arborist Number WE-0258A ISA Qualified Tree Risk Assessor

P.O. Box 447, Glen Ellen, CA 95442-0447 Phone/Fax 707.935.0892 ssanborn@sonic.net

http://www.sherbysanborn-arborist.com

November 16, 2018

Don DeCristo
Don Joseph De Cristo Family Trust
7356 Country Club Drive
La Jolla, CA 92037

Re: Tree Preservation Plan For 109 Ellis Street, Petaluma.

Summary

The above property has 6 trees growing on it. None of the trees are protected trees as described in the City of Petaluma's Tree Preservation Ordinance. One tree is in good condition, four are in fair to poor condition, and one is dead. None of the trees are in locations where they can be protected and preserved due to proposed construction at their location.

Scope of Work

All trees at the site were identified on a map and numbered, and their trunk diameter and crown radius recorded. The tree evaluations include a cursory evaluation of the general health and structure of each tree growing within the limits of the proposed new Development. This evaluation is based upon VTA, Visual Tree Assessment (Mattheck 2007). The evaluation describes the status of the trees and an assessment of construction impacts of the proposed project on each tree. Recommendations for the disposition of each tree and Preservation measures for protected trees will be included, as well as, recommendations for further tree condition diagnostic procedures or other appropriate arboricultural procedures.

Limitation of Observations

Nothing in this document should be construed as a tree risk assessment.

Construction impacts such as soil compaction, root cutting, mechanical damage and improper pruning, to name just a few human activities, can affect tree health and safety. Therefore, my evaluations are based on the condition of these trees on November 13, 2018. I cannot be held responsible for activities or impacts that occur after the above date. As an arborist, I make recommendations based upon on-site observation and information regarding the trees and the sit provided to me by the client. Such information, if inaccurate or incomplete, will affect the accuracy of these recommendations. In addition, property boundaries should be verified by client before treatments are applied. Failure to do so can lead to trespass and legal damages.

Disclosure Statement

Arborists are tree specialists who use their education, knowledge, training and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the recommendations of the arborist, or to seek additional advice.

Arborists cannot detect every condition that could possibly lead to structural failure of a tree or anticipate extreme weather events that could contribute to failure. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like any medicine, cannot be guaranteed.

Treatment, pruning and removal of trees may involve considerations beyond the scope of the Arborists services such as property boundaries, property ownership, site lines, disputes between neighbors, and other issues. Arborists cannot take such considerations into account unless complete and accurate information is disclosed to the arborist. An arborist should then be expected to reasonably rely upon the completeness and accuracy of the information provided.

Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

Observations

The property has six trees growing on it along with numerous shrubs. See table page 4 and tree location map page 6. None of the trees are protected species as defined in 17.040 of the City of Petaluma Tree Preservation Ordinance. All of the trees on the site are deciduous with the likelihood that their condition and overall appearance is a combination of natural leaf fall and lack of irrigation. Overall the number of dead branches and none viable buds are good indicator of neglect and decline.

In general, the trees have been poorly maintained and without regular irrigation. Decline includes dead branches, dead trunks (multi-trunk trees), sprouting from roots and root collar, or along the margin of live and dead cambium. As a result, most of the trees have poor structural characteristics including narrow angles of attachment with imbedded bark in both trunks and branches. Tree #5 is dead while tree #6, a fig, is in good condition in terms of both health and structure.

Terms and Definition

Tree Rating: Trees are rated based their health and structure. There are four rating categories: very-good, good, fair, and poor. Trees rated in *good* to *very-good condition* are in good health and structurally sound with only a few minor correctable defects. Trees in *fair condition* have defect, disease, or health conditions which can indicate a higher risk of failure reducing their landscape value. For trees in *fair condition* it may be possible to improve their rating to good by reducing defects, treating insect or disease problems, and by improving growing conditions. Trees in *poor condition* show poor vigor, possess significant diseases and/or structural defects and may represent a high risk of failure. Defects in such trees are usually not correctable. Trees in *poor condition* have a very low landscape value.

Acute angles of attachment: Also known as a “V-crotch” describes a narrow angle of attachment between a branch and its parent (branch of origin), the trunk, or codominant stems (see below). The branch bark ridge is usually not visible in branches with acute angles and often result in imbedded bark (see below). For examples refer to Appendix C figures 8 and 9.

Branch Structure: This refers to the distribution of branches along the trunk and scaffold branches i.e. are branches evenly distributed within the upper two-thirds of the tree. In addition, are branches well spaced and free of interference or conflicts (crossing or lay upon one anther)?

Codominant: Either stems (trunks) or scaffold branches of equal size and relative importance, usually arising from a parent branch or trunk at the same level.

Crown: The leaves and branches of a tree measured from the lowest branch on the trunk to the top of the tree.

Crown Radius: is the maximum crown radius (the distance from the trunk center to the outer edge of the longest branch). Tree crowns are usually not symmetrical. In addition, the crown may not be centered over the tree's root collar (the area at the base of the tree where the trunk and roots merge).

Defects: Cracks, splits, imbedded bark, cavities, dead or exfoliating bark, decay, insects, or disease.

Health: Represents how well the tree is growing and its general vigor. These somewhat subjective factors include crown density, branch distribution, number of dead branches, leaf color, number of leaves, the existence of viable buds, and last season's growth.

Imbedded Bark: Bark that has developed between the union of two trunks, branches, or the trunk and a branch. Imbedded bark weakens the union increasing the likelihood that the union will fail and either the trunk or branch will tear out. Refer to Appendix C, figure 9 for an example.

Repair Structures: Generally, these include bulges, swellings, and other abnormalities where the tree has responded to cracks, splits, injuries, and decay by adding wood to strengthen the affected area.

Root Collar: The area at the base of the tree where the trunk and roots merge.

Scaffold Branches: The large branches that form the main structure of the crown. These branches arise from the trunk or trunks and they are the parent branches for the smaller branches in the crown.

Structure: This is the evaluation of overall branch distribution, size ratio of branches to their parent branch or the trunk, acute angles of attachment, imbedded bark, trunk and root collar damage, trunk lean, bulges, cracks, and other factors.

Tree Protection Zone: The area encompassed by the outer edge of the crown or dripline. For trees with an irregular crown, this zone should be determined by using crown radius forming a circle when measured from the center of the trunk. The tree protection zone is usually the minimum area to be excluded from construction activities. Depending on the species tolerance to root disturbance, this area can be larger or smaller.

Trunk diameter: is measured at 4.5 feet above median soil grade also known as DBH (diameter breast height). Trees that have more than one trunk or stems joined at or just above ground level are defined as multi-trunk. Each of the trunks of multitrunk trees is measured at DBH. Trees with branches arising at or below 4.5 feet are measured at the narrowest point between the lowest branch and the ground.

Tree List

Location: 109 Ellis Street, Petaluma, CA

Tree Number	Common Name	Species	Number of Trunks	DBH (trunk diameter)	Crown Radius	Health	Structure	Mitigation Measures
1	Common Hawthorn	*Crataegus oxyacantha*	8	6, 7, 4, 6.5, 3, 3, 2, 2.5	11.0	Fair	Fair	Remove
2	Common Fig	*Ficus carica*	2	5, 3.5	6.0	Poor	Poor	Remove
3	Common Fig	*Ficus carica*	4	3, 5, 2.5, 1.75	6.5	Fair	Fair	Remove
4	Bald Cypress	*Taxodium distichum*	3	5, 4.5, 2.5	11.0	Fair	Fair	Remove
5	Dead	*?*	1	18.0	N/A	Dead	Dead	Remove
6	Common Fig	*Ficus carica*	20+	43103.0	10.0	Good	Good	Remove

Adjacent Trees

Trees adjacent this property and in close proximity to the property line include six Italian cypress trees growing along the northwest property boundary close to the fence. These are small trees whose crowns barely touch the fence. There is also a dead European White Birch close to the apartment complex. Within the riparian corridor east of the chain-link fence, there are several Black Walnut trees, some Lombardi Poplar and a pine tree. None of those trees should be impacted by the proposed site development.

Recommendations

None of the six trees on the property are protected species specified in the City of Petaluma Tree Preservation Ordinance. Due to their condition, their location within the building envelope, their small size, and their generally poor condition, I recommend all six be removed.

Replacement Trees

Section 17.065-A, Tree Mitigation and Replacement, appears to apply only to protected trees and none-protected trees don't have specific replacement requirements. The proposed site plan dated October 9, 2018 indicates numerous small trees will be planted throughout the development and additional trees will be planted in the bio retention area. This may more than satisfy the Cities requirements.

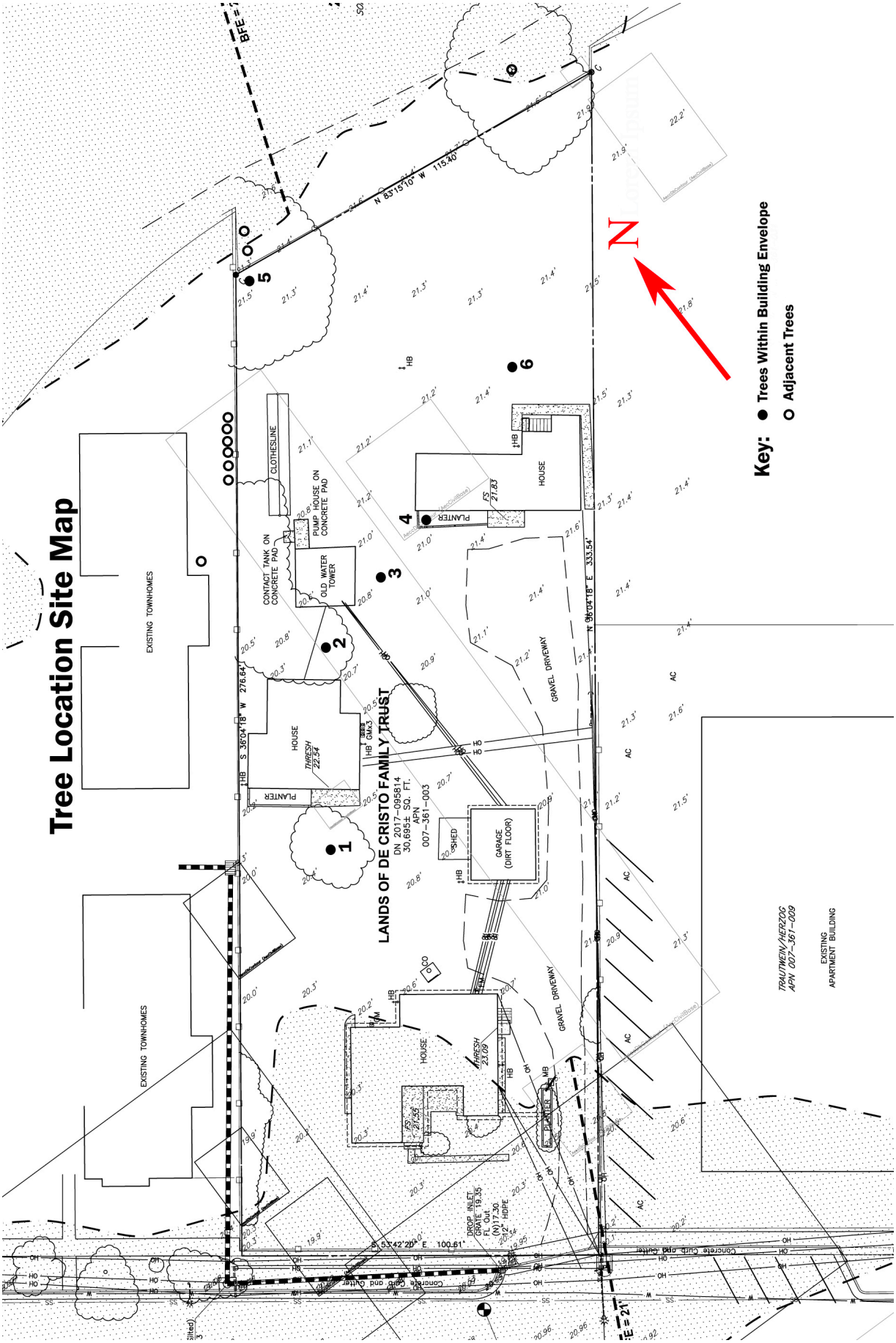
Sincerely,

Sherburn R. Sanborn
ISA Certified Arborist WE-0258A

SRS: ss

References:

Mattheck, Claus, 2007. *Updated Field Guide for Visual Tree Assessment*. Forshungszentrum Karisruhe GmbH. 170 pages.


Tree Location Site Map
Key:
Trees Within Building Envelope
Adjacent Trees
N
LANDS OF DE CRISTO FAMILY TRUST
DN 2017-095814
30,695± SQ. FT.
APN 007-361-003
EXISTING TOWNHOMES
EXISTING TOWNHOMES
HOUSE
GARAGE (DIRT FLOOR)
SHED
OLD WATER TOWER
PUMP HOUSE ON CONCRETE PAD
CONTACT TANK ON CONCRETE PAD
CLOTHESLINE
PLANTER
GRAVEL DRIVEWAY
GRAVEL DRIVEWAY
TRAUTWEIN/HERZOG
APN 007-361-009
EXISTING APARTMENT BUILDING
DROP INLET
GRATE 19.35
FL Out
(N)17.30
12" HDPE
S 53°42'20" E 100.61'
N 89°15'10" W 115.40'
S 36°04'18" W 276.64'
N 36°04'18" E 333.54'
1
2
3
4
5
6

Appendix A

Tree Protection Measures

1 - Protective Fencing:

All trees to be preserved should be protected by fencing the area under the dripline. Ideally the fence should be secured so that it can't be moved.

Fences should be erected before any, grading or construction begin and remain in place until the final project inspection.

No construction equipment or materials should be stored within the root protection zone. In addition, no dumping of toxic materials shall take place either within or near the tree protection zone. This includes gasoline, other petroleum products, broken drywall, and concrete spoils to name just a few materials potentially toxic to trees and tree roots.

A prominently displayed warning sign can alert workers to the sensitivity of the fenced tree protection zone. The sign should clearly state: "WARNING – *Tree Protection Zone* – This fence shall not be removed contact project arborist for additional information."

2 - Protective Mulch:

Applying mulch within the tree protection zone can greatly benefit protected trees. Always use composted coarse wood chip mulch that will not compact. Raw wood chips direct from a chipper, composted chips or Arbor Mulch are all beneficial for trees. Keep mulch away from root collar—large trees require 1 foot of clearance. Mulch should be no more than 2-3 inches deep. Protective mulch used to reduce soil compaction from vehicle traffic should be 6-8 inches deep. Mulch this deep should be temporary and must be removed to a final depth of 2-3 inches when construction is completed. It may also be necessary to reduce mulch depth during the winter months to prevent souring (mold build up).

3 - Irrigation:

All trees, including native oaks can benefit from irrigation prior to and during construction, particularly during our hot summer months. Irrigate the outer two thirds of the crown radius using soaker hoses or a drip irrigation system. For native oaks, it is critically important that irrigation be kept away from the trunk and root collar. When irrigating large oaks, keep water at least eight feet from the trees root collar and trunk. Never allow water to splash on the trunk and root collar. Irrigate to a depth of six inches and allow soil to dry completely before the next irrigation. It may take many hours to moisten the soil to a depth of six inches. The easiest way to test the penetration depth is to dig several small holes within the irrigated area using a garden trowel or similar tool. If the soil isn't moist continue watering. Oaks should be irrigated once every six weeks while other trees can be irrigated more frequently.

4 - Soil Grade Changes:

No soil grade changes should occur within the tree protection zone. Grade changes should be minimized immediately outside the tree protection zone and should not direct water into root collar area of trees.

5 - Trenching and Root Pruning:

Trenches should be dug using an air-spade or by hand—no power tools or mechanical trenching devices. The air-spade uses compressed air to remove soil around roots without damaging them. Digging should be done in a manner that avoids damaging roots larger than 1 inch. All roots should be cut at right angles and when possible, preferably back to a lateral. Any roots cut during trenching operations should be cleanly cut, at right angles, to sound wood using either pruning shears, loppers, pruning saws or

chainsaw. **Why not mechanical trenching?** Most mechanized trenching devices, such as a ditch-witch, don't cut roots cleanly. The root is grabbed, pulled, and torn leaving a ragged, broken surface. Because roots are elastic, when grabbed by a trencher the root stretches before it breaks then snaps back. This action can cause splits and other types of damage to occur between the break and the tree trunk. Such injuries cause roots to die back and provide avenues for soil borne fungi to attack them.

6 - Landscaping Under Native Oaks:

To insure the longevity of native oaks, landscaping underneath their crown should be kept as natural as possible. Irrigation systems should only be installed outside the dripline (the width of the crown, as measured by the lateral extent of the foliage). For more information regarding landscaping under native oaks, see the publication: *Compatible Plants Under and Around Oaks*, California Oak Foundation, http://www.californiaoaks.org/

Appendix B

Understanding Tree Roots

Where and how deeply roots grow depends on the soil conditions of the site. In fertile, well aerated soil with little competition from other trees, roots will extend in a more or less symmetrical pattern. The roots of a tree can grow laterally through the soil up to two or even three times the radius of the trees crown (figure 11). In addition, approximately 80% of a tree's roots develop within the first twelve to eighteen inches of soil with few roots growing beyond a depth of three feet. The most important limiting factor affecting root development is soil density and oxygen availability. Sonoma County soils have high clay content so they are denser with lower oxygen levels. This forces roots to grow closer to the surface. Water in the form of rain or irrigation, has a significant affect on soil oxygen levels. As water penetrates the soil it displaces carbon dioxide pushing it out of the soil while at the same time drawing oxygen in. Other than natural rainfall, native oaks do not need to be irrigated. Exceptions to this rule include active construction sites and periods of severe drought. Prior to and during construction, stress to protected trees may be reduced by periodic irrigation particularly during the summer months of July, August, and September. During periods of drought, it may be appropriate to supplement natural rainfall by irrigating oaks during the spring and early fall. Irrigation should be deep and infrequent and it should be kept 10 feet away from the trunk and root collar, particularly when sprinkler systems are used.

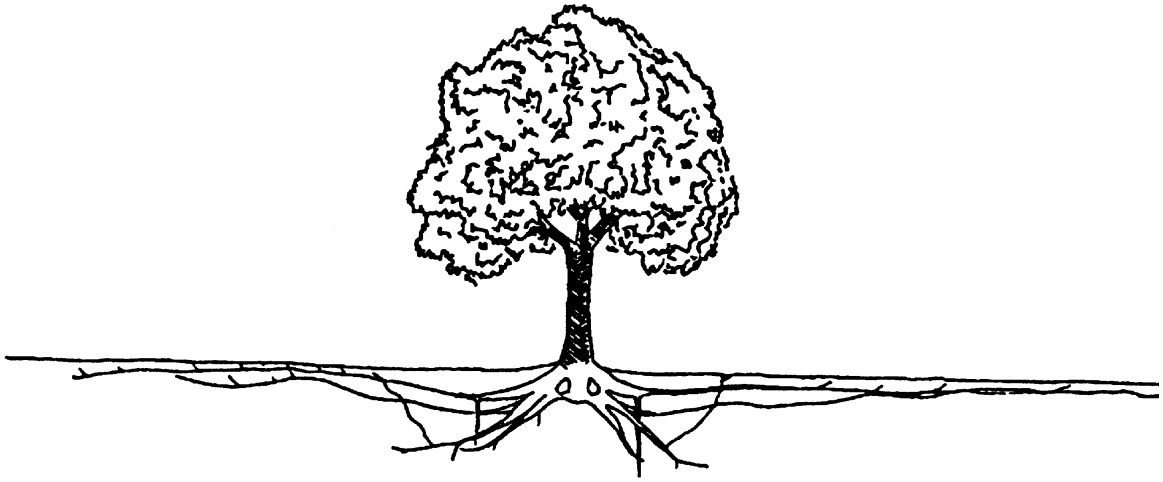


Figure 11

Appendix C

Tree Pruning Guidelines

Tree pruning should meet or exceed the pruning standards found in ANSI A300 and the current ISA *Tree-Pruning Guidelines*, 1995.

Basic Pruning Techniques

Making a proper pruning cut affects tree health because it affects how the tree responds to the wound created by the cut.

Trees grow by adding a layer of woody tissue around the existing tree each year. In the spring when tree growth begins, new wood is added to the outer branches first. Where these branches attach to a parent branch or the trunk, the new wood is diverted laterally around the parent branch, surrounding it. This wood tissue then merges underneath and connects to the wood of the trunk or parent branch. Next, a layer of wood is added to the trunk or parent branch and where this wood encounters the new branch wood, it diverts around the branch and envelops the branch wood. The swelling that results from the

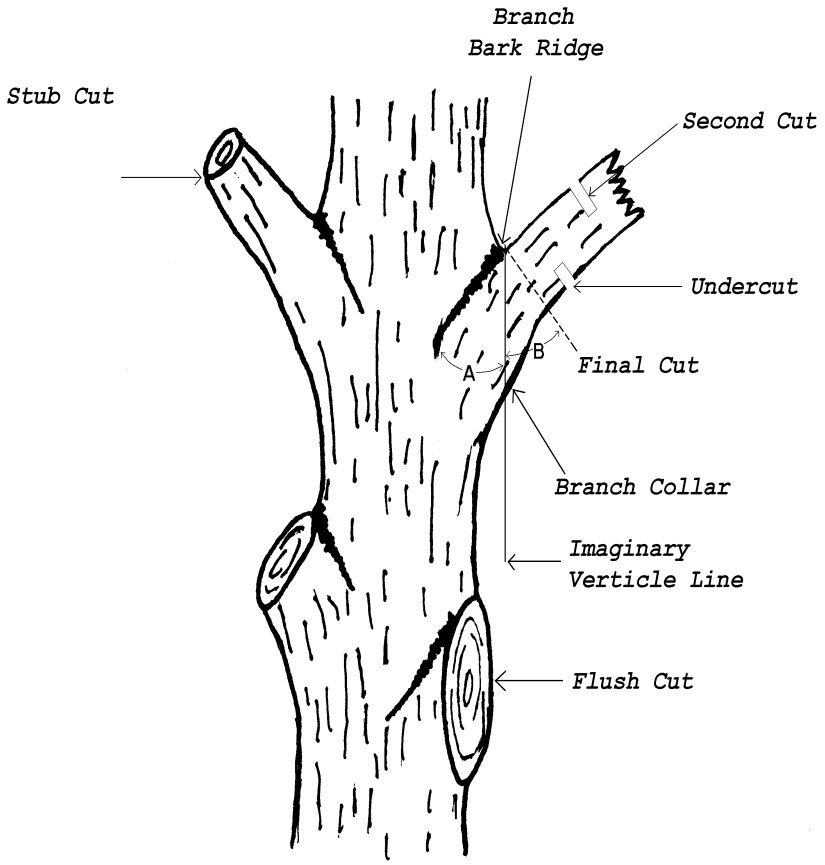


Figure 6

overlapping of wood at the branch union with the trunk or parent branch is called the '***branch collar***.' The raised strip of bark in the branch crotch is called the '***branch bark ridge***' (figure 6). Preserving the branch collar significantly affects wound closure and prevents decay from entering the parent branch or trunk.

There are three types of pruning cuts: thinning, heading and drop-crotch. Of the three the thinning cut is preferred because it preserves the branch collar so that the tissue of the trunk or parent branch is not injured or wounded. Pruning cuts that remove only branch wood, with the cut placed just outside the branch collar, are called '***natural target pruning***.' Trees respond to wounding by forming protective barriers that isolate the injured, diseased, or decayed wood. A pruning cut that preserves the branch collar limits the invasion of diseases or decay to the branch wood that remains after the branch is cut. An improper cut that removes the branch collar, often called a ***'flush cut,'*** (figure 6) can allow disease and decay to invade and weaken the wood of the trunk or parent branch. Flush cuts can lead to decay that over time may result in tree or branch failure.

Making a thinning cut is a four step process (refer to figure 6):

1. Identify or estimate the location of the branch collar. Branch collars can be inconspicuous, sunken, slightly protruding, or bulging.
2. Undercut the branch to be removed approximately two to six inches from branch collar. This undercut will prevent the bark under the branch from peeling or tearing away from the trunk or parent branch.
3. The second cut should go completely through the branch several inches outside the undercut. This will leave a stub.
4. Finally, remove the remaining branch stub at a point just outside the branch collar. If the branch collar is not obvious, draw an imaginary line parallel with the trunk or parent branch starting at the top, outer edge of the branch bark ridge. Now approximate angle **A** between the imaginary line and the branch bark ridge and make your pruning cut so angle **B** is the same as angle **A** (Figure 6).

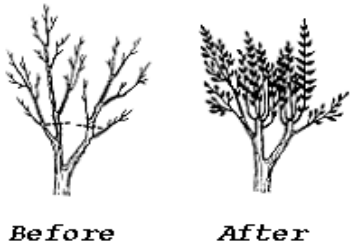


Figure 7

Heading cuts are made between branches or in the case of younger trees between nodes (Figure 7). When heading cuts are applied to large or mature trees it is called ***'topping.'*** Heading or topping a mature tree is often done to reduce its crown height and width. Some trees can be killed because topping can remove too much foliage. Topping allows decay to develop in branches and trunks, destroys the trees natural shape, and results in sprouting that produces many weakly attached branches. As the sprouts become larger over time, they frequently break out because of poor attachment while weak tree structure can result in a hazardous tree. In general, shade and ornamental trees should never be topped. Another form of heading is called ***'pollarding'*** that is sometimes used to create a tree with a round compact crown. Pollarding is most often seen in mulberry and sycamore.

Drop-crotch cuts remove the outer portion of a branch back to a smaller diameter branch 1/3 to 1/2 the diameter of the branch being removed (Figure 8). The size of the remaining branch is important because it must be large enough so it can become the new leader or terminal branch. Drop-crotch cuts are often used on young trees and less frequently on large, mature trees to redirect branch growth. Utility line clearing crews often use this method to redirect branch growth away from power lines. The correct location for the cut is through an imaginary line that bisects the angle formed by points A, B, and C

(figure 8). Line A to B is perpendicular to the branch to be removed while line A to C is formed by a line running through the branch bark ridge.

Before pruning a tree you have to decide where and how much foliage to remove. Remember, removing to much foliage can injure or kill a tree because leaves manufacture food by converting sunlight and carbon dioxide (CO_2) into sugars and Oxygen (O_2). Also remember, you can't feed a tree. Fertilizer is not food; it only provides essential elements like nitrogen, potassium, and phosphorus.

Here are some simple rules to consider before you begin:

- ✓ Never remove more than 25% of a trees live crown annually. This is particularly true for oaks.
- ✓ It is very important to have foliage or live crown distributed throughout the upper 2/3 of the tree. This also applies to branches i.e. foliage or smaller branches should arise from at least 2/3 of the branches length. Removing only interior branches, also called ***'lion-tailing'***, leaves all the foliage on the ends of the branches. Lion-tailing can actually cause branches to grow more rapidly in an effort to replace lost foliage. It can also cause sunburn and excessive sprouting. All these effects can result in weak or broken branches. ***Crown Cleaning*** **a tree care industry practice, where small branches and epicormic sprouts are removed from large sections of the trunk and scaffold branches, is a technique I do not recommended particularly when applied to native oaks.**
- ✓ Whenever possible avoid removing branches that are larger than four inches in diameter.

<u>Pruning Young Trees</u>

Pruning trees while they're young offers the greatest potential to affect their future size, shape, health, and safety. Because their branches are relatively small, pruning wounds close more rapidly so this is an opportune time to improve branch spacing or remove branches that will become crowded over time. Young trees should also be pruned to promote their shape and structure and to remove lower branches that may interfere with people or property as the tree matures. Immature trees often develop two or more

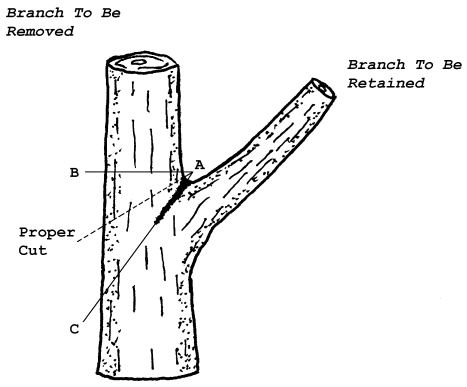


Figure 8

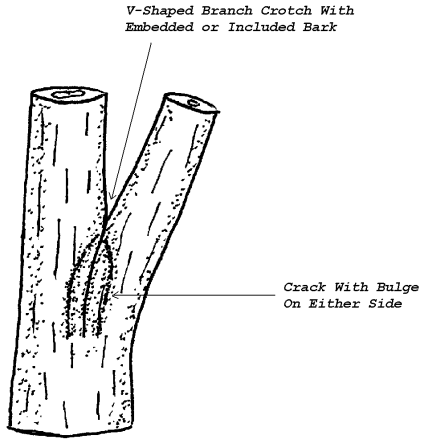


Figure 9

leaders or main stems (trunks). These ***'Codominant'*** stems sometimes conflict with each other and develop tight or ***'V-shaped'*** branch crotches with no branch bark ridge (figure 9). If one or more codominant stems exist and are larger than ½ the main trunk diameter, one or more should be removed to reduce crowding and ***'embedded bark'*** that can lead to branch or trunk breakage when the tree matures (figure 9).

Pruning Mature Trees

The outdated practice of cutting branches flush to the trunk and removing the branch collar destroys the natural protective zone. Flush cuts are more damaging in mature trees because branches are usually larger, so cuts are larger, and ***'woundwood'*** or ***'callus'*** tissue forms more slowly. Because of this, thinning and drop-crotch cuts are preferred because these cuts preserve the trees protective zone. Drop-crotch cuts are primarily used to reduce the length of branches while thinning cuts are used to remove dead, dying, diseased, or conflicting branches back to the parent branch or trunk. When possible, avoid removing branches that are larger than 4 to 5 inches in diameter because the wound takes longer to close. Before removing any live branches, first remove all dead branches from the crown. Now look for branches that are rubbing other branches, are less vigorous, and those with poor branch attachment. Pay particular attention to branches with V-shaped crotches or embedded bark (figure 9) because they are much more likely to break out. Ornamental and shade trees are best pruned by the method called 'thinning.' Through this method, branches are selectively removed, using thinning cuts, to preserves or improve the trees natural shape. Thinning also can be used to improve structure, reduce height and spread, reduce the weight of large lateral branches and improve wind resistance. Figure 10 illustrates how thinning preserves a trees natural shape.

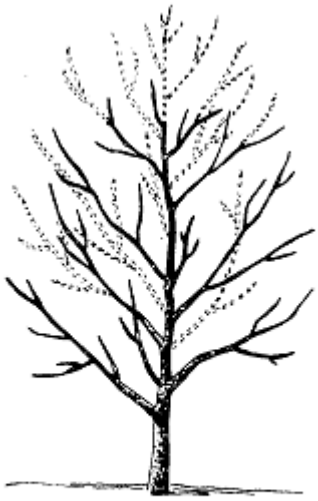


Figure 10