

# Pruning Trees, Palms, Shrubs and Hedges



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## What contractor and personnel qualifications are required?

1. The contractor shall have in good standing a current State of Hawaii Landscape Contractors License (C-27) or a Tree Trimming License (C-27A) with all required current insurance coverage (workman's compensation, liability, vehicle insurance, etc.). See Chapter 13, "Contractor Qualifications."
2. The contractor shall employ a minimum of one International Society of Arboriculture (ISA) Certified Arborist who has been certified for a minimum of six continuous years working with local tree species and risk assessment experience.
3. The contractor shall employ a minimum of two Western Chapter International Society of Arboriculture (WCISA) Certified Tree Workers, each with a minimum of three continuous years of tree work experience with local tree species.

4. The contractor shall provide the names, phone numbers, current ISA certification numbers with copies of certificates and written work experience information for each ISA Certified Arborist and WCISA Certified Tree Worker.
5. The Certified Arborist shall be directly in charge of all tree work done within the designated areas of the State highway rights-of-way and shall be at the work site whenever work is in progress. The Arborist shall work under the direction of the HDOT Engineer and shall notify the Engineer in writing, email or fax of any hazard and/or high risk trees observed on State highway rights-of-way within 12 hours. "High Hazard" rated trees shall be mitigated when identified.
6. All tree work shall be performed by an ISA Certified Arborist and/or WCISA Certified Tree Workers.
7. Contractor and/or his employees shall have applicable permits, licenses, certifications and training required to prune trees within the State highway rights-of-way prior to signing of contract and commencement of work.
8. Contractor and his employees shall have a thorough working knowledge of current ANSI A 300 (Part 1) 2008 Pruning Standards, ANSI Z133.1-2006 Safety Standards, Tree Care Industry Association Electrical Hazards Awareness Program and other federal, state and county regulations (see Chapter 3, "Landscape Maintenance Zones, Distances and Heights.")
9. Should employment of the Certified Arborist and/or Certified Tree Worker cease during the course of the contract, the contractor will have 10 interim work days to employ a qualified replacement and provide in a timely presentation proof of qualification to the Highways Division Maintenance Engineer. Failure to cooperate could result in contract cancellation or penalties.



## **What is pruning and how does it affect re-growth?**

**Pruning:** The selective removal of plant parts to meet specified goals and objectives (ANSI A300 [Part 1] 2008).



## Chapter 6: Pruning Trees, Palms, Shrubs and Hedges

There should be a logical reason or purpose for making each pruning cut. An important part of effective pruning is observing plant response to note whether the desired effect is being accomplished. Pruning is a skill acquired through knowledge, practice and observation.

The parts removed during pruning will usually include small to medium branches that support a significant portion of the leaves of the plant. The leaves of any plant are essential to the life of the plant. Leaves are responsible for making the plant's food (in the form of sugars) by the process of photosynthesis. This food (sugar and starches) is used for the growth of new shoots and leaves. Leaves also pull water and dissolved minerals up from the trunks and branches. If too much of the tree crown is removed during pruning, these important processes will be interrupted and can cause major tree decline or tree death. This is why it is very important that only a small portion of the tree crown be removed at any one time. The general rule of pruning is to remove no more than 25% to 30% of the total crown with each pruning. Some tree species may only withstand 20% removal at one time, others over 30%.

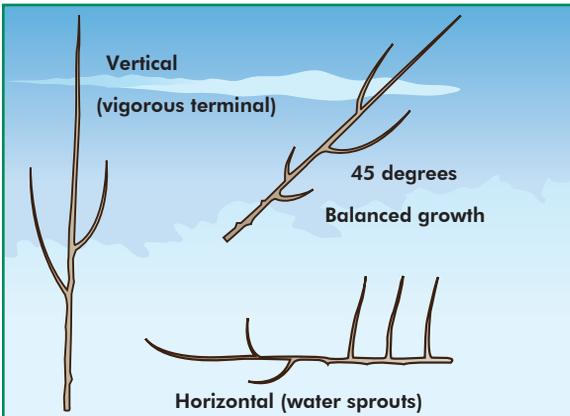
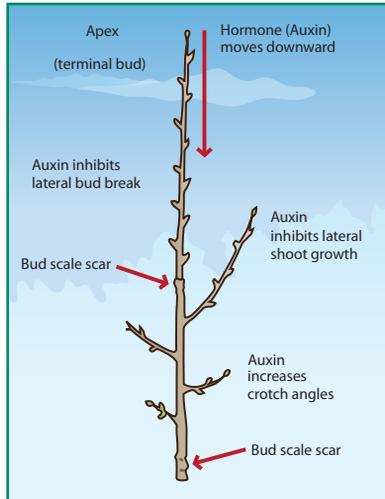
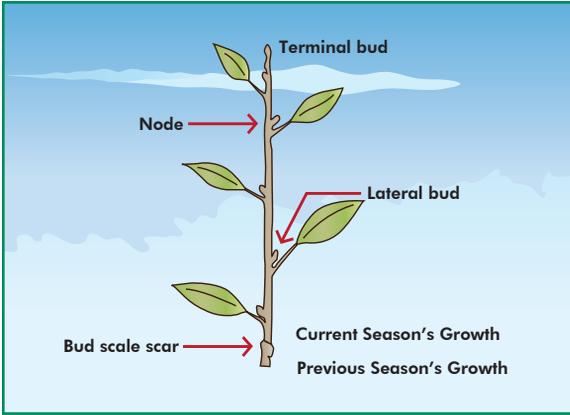
A **node** is the point on the stem where a leaf or bud is attached. One to three **lateral buds** are produced at each node. Growth of lateral buds is controlled by the **terminal bud** through the production of a hormone called auxin.

**Auxin** moves downward in the shoot from the terminal bud at the tip of the shoot and regulates the growth and development of lateral buds. This phenomenon is called **apical dominance**.

Apical dominance influences the number of shoot-forming lateral buds, the lengths of lateral shoots formed, and also the angle at which the shoots emerge from the main limb. This angle, called the **crotch angle**, remains the same throughout the life of a tree.

Trees with strong apical dominance develop into **excurrent** trees (single main trunk). Trees with weak apical dominance develop into **decurrent** trees (multi-major trunks). Most tropical trees are decurrent.

JARGON



## The general response of plants to pruning:

- ▶ Removing the apex (topping or heading cuts), temporarily destroys apical dominance and may stimulate the rapid growth of lateral buds into shoots called water sprouts. Removing the apex of a tree generally is not acceptable.
- ▶ Pruning reduces the size of the above-ground portion of the plant in relation to the root system. As a result, the undisturbed root system services a smaller number of shoots and buds. The relative uptake of water and nutrients by the remaining shoots and buds increases, and a flush of growth (re-growth) occurs.
- ▶ Pruning usually stimulates re-growth near the cut. Vigorous shoot growth may occur within 6 to 8 inches of the pruning cut. This is particularly true for vertical limbs that have been pruned. Regrowth on horizontal or nearly horizontal limbs, 45° to 60° angle from the vertical, may develop farther away from the cut.

## Pruning goals and objectives:

Pruning objectives shall be established prior to beginning pruning and shall include one or more, but not limited to:

- ▶ Protect persons and property from injury or damage
- ▶ Reduce risk of failure
- ▶ Provide clearance
- ▶ Improve tree structure
- ▶ Manage and improve tree health
- ▶ Improve views
- ▶ Improve aesthetics
- ▶ Restoration of damaged trees
- ▶ Regulate growth by implementing regular pruning cycles
- ▶ Removal of high risk trees and invasive species
- ▶ Comply with State highway rights-of-way regulations



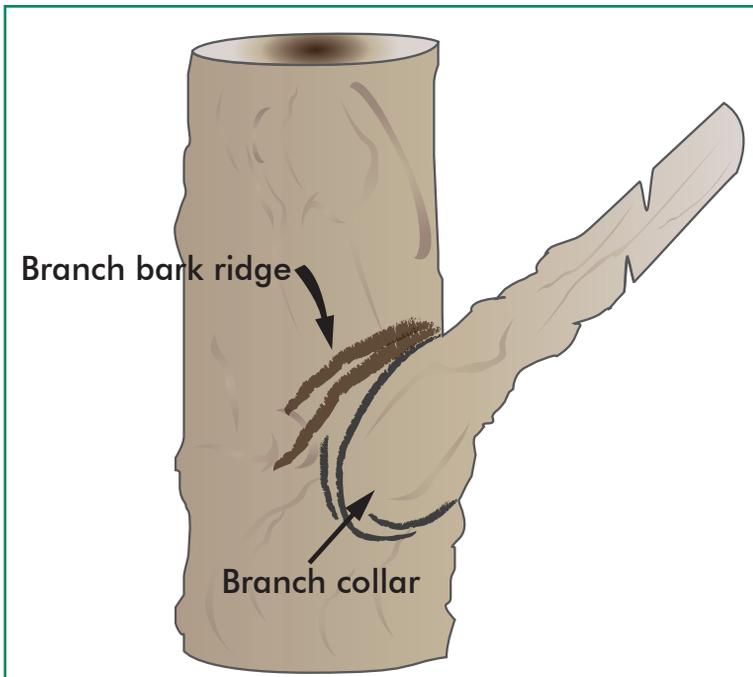
## Where and how do I make pruning cuts?

Trees form natural protective defense systems (barriers) to defend themselves from natural negative events (storm, wind, fire, disease, insects, drought, etc.). The addition of chain saws and construction equipment in recent years has created new negative events that can damage tree defense systems. We must understand how and where the natural barriers form before we can make proper pruning cuts.

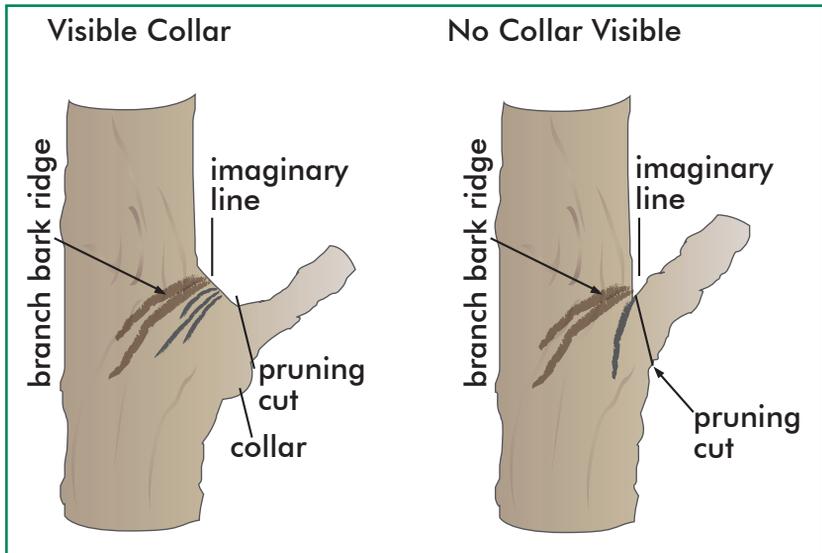
### Where to make pruning cuts:

The following terminology is needed to identify pruning locations.

**Branch collar:** The swollen area at the base of the branch.



- The branch collar contains special types of plant cell tissues that, after a branch is removed, form wound wood. A collar develops into callus wood that gradually grows over the wound.



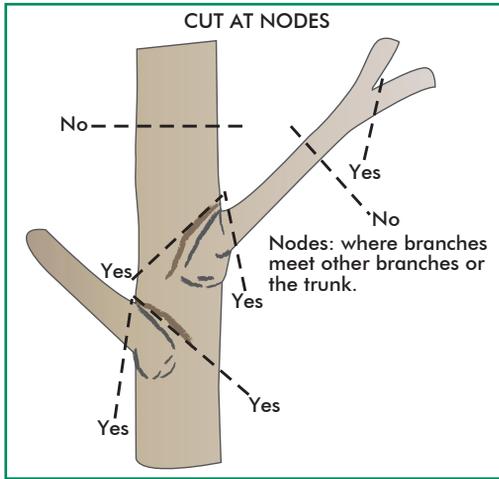
- By removing limbs with a cut just outside the edge of the branch collar, the branch's own protective zone remains intact and eventually closes over the open wound.
- Cutting too close to the trunk, called a flush cut, will remove much of the branch collar and the wound may not close properly; potentially leading to decay.
- Leaving a stub beyond the edge of the branch collar also should be avoided as this may result in decay of the trunk and a generation of unwanted water sprouts.

**Branch bark ridge:** The raised area of bark in a branch crotch that marks where the branch and parent stem meet. Natural pruning cuts should be just outside the branch collar and ridge as described in the previous drawings.

**Tip**

Although callus closes over a wound, this does not always mean there is no decay concerns in the branch or trunk.

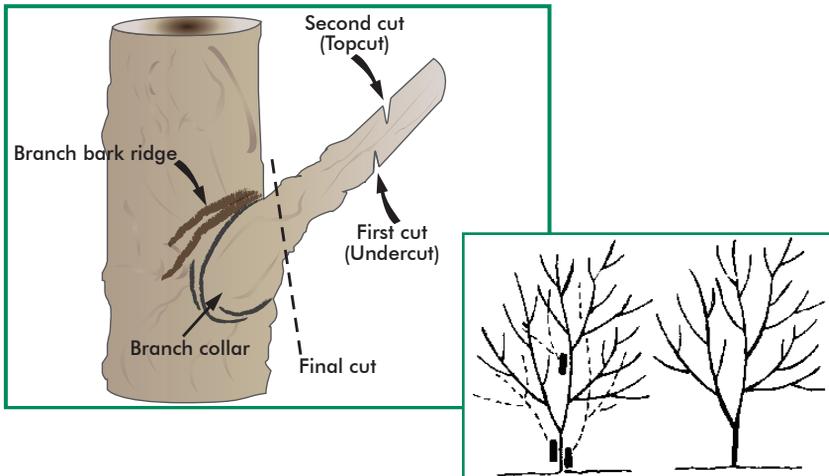




## How to make pruning cuts

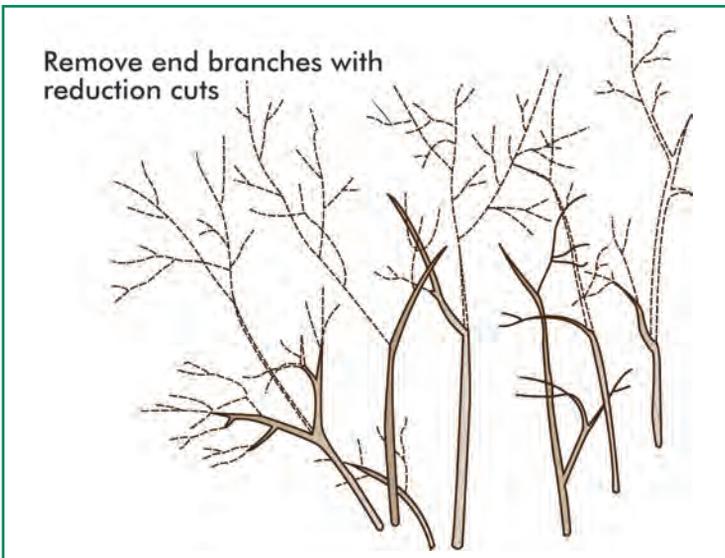
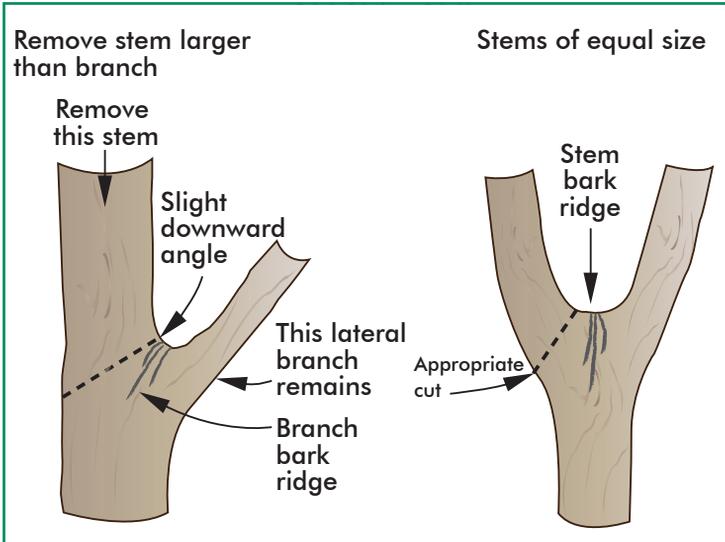
Tree pruning procedures combine three basic pruning cuts: Removal cut, Reduction cut and Heading cut. These cuts are used in **natural pruning** and should be just outside the branch collar and ridge as described in the drawing.

- 1. Removal cut (collar cut):** Cut that removes a branch at its point of origin, which could be the main trunk or lateral branch. This is used in crown cleaning and crown raising.



Use care not to wound the trunk when pruning

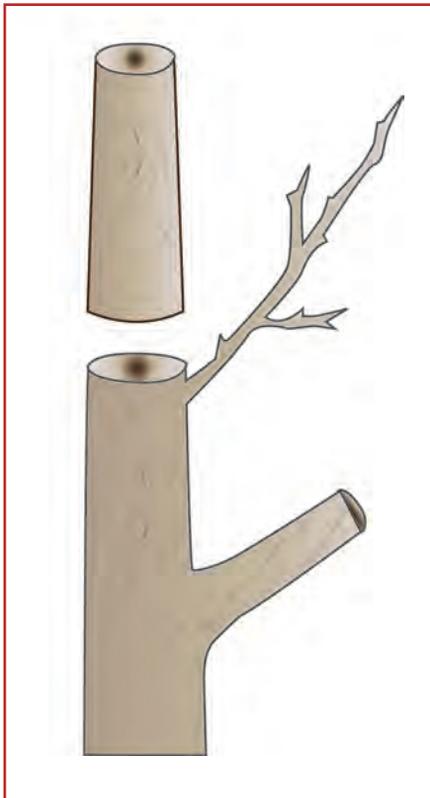
2. **Reduction cut:** Pruning cut that reduces the length of a branch or stem back to a lateral branch large enough to assume apical dominance – typically at least 1/3 of the diameter of the cut stem. This cut is used in directional pruning and crown reduction.



- 3. Heading cut:** The reduction of a shoot, stem, or branch back to a bud or to a lateral branch not large enough to assume the terminal role.

**Tip**

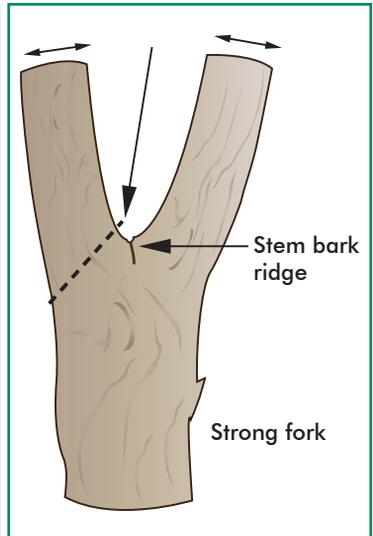
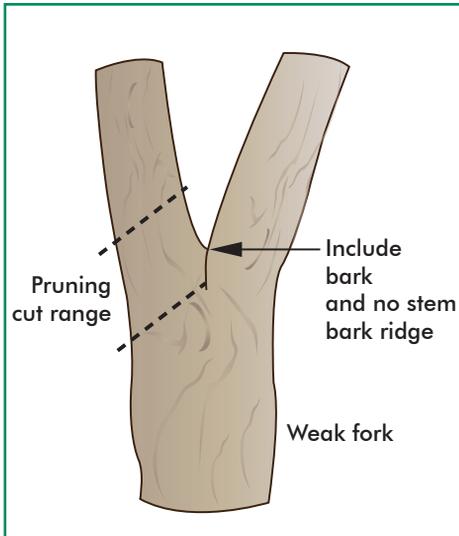
Heading cut should not be used in regular pruning maintenance programs. A heading cut is a less desirable pruning cut and is used in special situations (restructure pruning and hedge pruning).



4. Pruning cuts on co-dominant trunks with and without included bark: See illustrations below.



Co-dominant stems with included bark



- 5. Three-cut system:** This method shall be used for removal of large branches that may rip if made with a single cut and branches cannot be supported during removal.

**Cut #1:** The first cut, on the underside, should be one to 2 feet out from the parent branch or trunk to a depth of approximately 1/4 of the branch's diameter or until the saw begins to bind up in the cut. Make sure that the cut is deep enough to cut completely through the bark and into the wood.

The undercut provides a point for a clean break when Cut 2 is made. Without the undercut, the branch will not break cleanly. It will tear down the length of the remaining stump and possibly damage the collar.



### **Safety!**

Without a clean undercut the falling branch may swing wildly and hit you before breaking and falling.

**Cut #2:** The second cut is the top cut. On small branches the cut should be above the first cut and slightly farther out on larger branches. If the undercut was made properly the branch will break cleanly at that point and fall straight down.

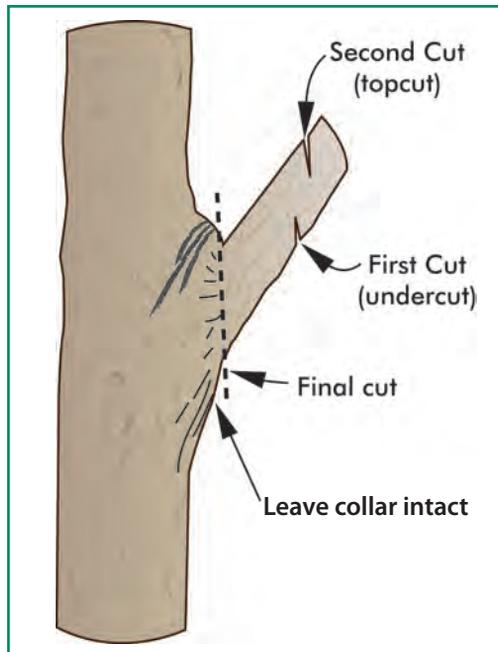
### **Tip**

Larger branches may need to be lowered with ropes to reduce damage to the tree and objects below.



**Cut #3:** The third and final cut is to remove the stub carefully back to the branch bark collar without tearing the bark below.

## Proper branch removal guidelines 3-Cut Method



Make this cut starting on the top of the branch just beyond the branch bark ridge at a slight angle away from the bottom of the collar.

- You should be able to see the entire collar on the trunk after the branch is removed. Do not leave a long stump.
- A faulty final cut will result in incomplete closure of the wound and possibly form a knot hole. Knot holes eventually lead to decay.

### Tip

Wound sealing paints or sprays are not recommended. They can interfere with the natural closure process of the branch collar.





**Tip**

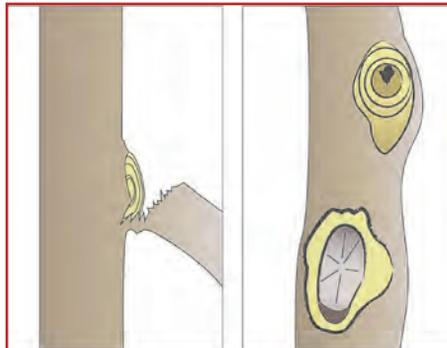
There are several tree species that do not form strong decay barriers when pruning cuts are made even at the proper location. Trees that are poor compartmentalizers (barrier formation) include: royal poinciana, eucalyptus, silk oak, yellow poinciana and avocado trees. Pruning cuts on the above trees should be kept to the smallest pruning cuts possible.

**Improper cuts to avoid: flush, stub, topping and rip cuts**

**Flush cuts:** When flush cuts are used to remove branches, this operation damages and breaks the natural branch bark collar barrier. This causes the tree to form a new barrier wall inward into the trunk or parent branch, creating a greater potential for decay to spread.



**Rip cuts:** Occur when too large a branch is removed with a single cut and the lower portion of the branch tears and rips the bark and cambium layer down the trunk or parent branch. The wound closure is difficult; decay and disease have a higher possibility of occurring.

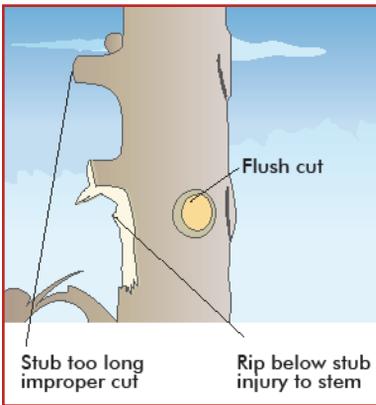


*Bark ripping*

*Flush cutting*

**Stub cuts:** Pruning a branch and leaving a section beyond the branch bark collar.

- The remaining stump will be too long for the collar to completely close over the end of the stump and the open end may eventually rot away.
- This situation can be remedied by removing the stump at the correct distance. This can be effective even if the limb was removed several years earlier, as long as the stump has not rotted.



*Improper removal of stub cut*



*Proper removal of stub cut*

**Topping cuts:** Stub cuts made at internode sections on the tree branches with no clear goal or objective.



*Improper topping cuts*



## What tools do I use for pruning?

All cuts shall be made with a sharp saw or sharp pruning tool in a manner that creates a clean cut, perpendicular and flat to the direction of growth. Cuts shall be just outside the branch bark ridge or collar without leaving a protruding stub and shall not tear bark or splinter wood.

### Large tree care equipment



*Aerial lift truck and chipper*



*Stump grinder*



*Crane*



*Chain saw*

Hand tools



*Bypass pruning shears*



*Loppers*



*Pruning saw*



*Hand pole saw*

Small power tools



Pole chain saw



Single blade hedge trimmer



Double blade hedge trimmer



Reticulated hedge trimmer



Small chain saw

Tools **UNACCEPTABLE** for making tree pruning cuts include: machete, dull hand or power saw, axes, etc.





## What safety procedures are required for tree pruning?

All workers shall be familiar with and implement ANSI-Z133.1-2006 Safety Standards. The ANSI-Z133.1 pamphlet is available to all staff. Employers shall instruct their employees in the proper use, inspection and maintenance of tools and equipment, including ropes and lines, and shall require that appropriate working practices be followed.

- ▶ Pruning shall be implemented by a ISA Certified Arborist and/or ISA Tree Worker familiar with the practices and hazards of pruning and the equipment used in such operations.
- ▶ Performance shall comply with applicable Federal and State Occupational Safety and Health (OSHA) Standards, ANSI Z133.1 and any other applicable requirements.
- ▶ The Certified Arborist and/or Tree Worker shall visually inspect each tree before pruning.
- ▶ If a condition is observed requiring attention beyond the original scope of work, the condition shall be reported to the Certified Arborist who shall submit written mitigation to the Engineer. It shall be the Engineer's responsibility to approve mitigation recommendation.
- ▶ Job briefings and safety work procedures shall be performed by the Certified Arborist in charge before each job. The briefing shall be communicated to all affected workers.
- ▶ Traffic Control: high visible safety apparel and head gear are required and shall conform to ANSI ISEA 1007-2001 and the U.S. Department of Transportation (DOT) manual.
- ▶ Effective means for controlling pedestrian and vehicular traffic shall be instituted on every job site where necessary (see Chapter 4, "Safety & Temporary Traffic Control in the Landscape Maintenance Zone").
- ▶ Personal Protective Equipment (PPE): Workers shall wear proper fitting and ANSI approved hard hats, eye protection, footwear and hearing protection at all times during pruning operations.
- ▶ Chain saw resistant leg protection shall be worn while operating a chain saw during ground operations.

- ▶ **Electrical Hazards:** The employer shall certify that each employee working in proximity of electrical lines has been trained to recognize and is appropriately qualified to work within proximity to electrical hazards.
- ▶ Arborist and workers shall be instructed and understand that electrical shock will occur by direct contact, indirect contact and ground faults. Refer to ANSI Z133.1 Standards, Section 4 Electrical Hazards.



No pruning shall be done within 10 feet of utility lines. Contact State Engineer to notify qualified Contractors to perform such work.



## **What pruning procedures improve tree health and reduce tree risk?**

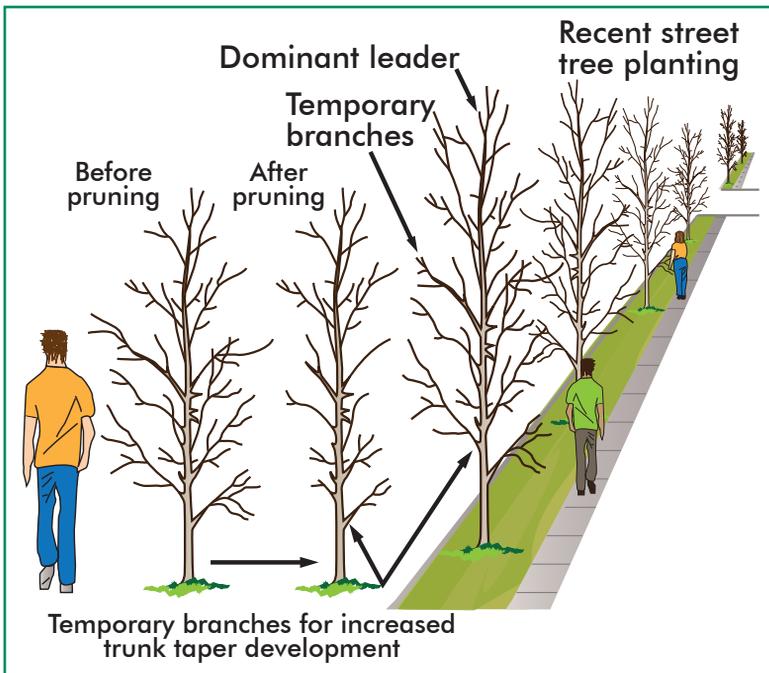
Pruning procedures most commonly used for rights-of-way include:

- 1. Structural Pruning:** Young and medium aged trees pruned to develop future safe structural characteristics. Structural pruning shall consist of selective pruning to improve tree and branch architecture primarily on young and medium aged trees.
  - ▶ Dominant leader(s) shall be selected for development depending on tree structure (excurrent, single main trunk or decurrent multiple trunk).
  - ▶ Remove branches that have included bark or have a high potential of developing included bark (narrow angle between branches) later in the growth cycle.
  - ▶ Strong, properly spaced scaffold branch structures shall be selected and maintained by reducing or removing less desirable branches.
  - ▶ Temporary lower trunk branches should be retained or reduced on newly planted trees to improve trunk taper. The lower

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branches shall be removed at the appropriate time as the tree matures.

- ▶ Interfering, over-extended, dead, defective, stubby, weak, broken, hanging and poorly attached branches and basal suckers shall be pruned or removed.
- ▶ The weakest most damaged of a pair or group of rubbing branches and/or included bark branch structures shall be removed. If the structural soundness has not been compromised, leave the most desirable branch.
- ▶ Do not remove water sprouts except where interfering with structural branches.
- ▶ Plan for proper ground clearance when selecting branches to remove in the LMZ (see Chapter 3, "Landscape Maintenance Zone, Distances and Heights.")



**2. Crown cleaning:** Pruning to reduce risk and improve health by removing non-beneficial branch parts, such as dead, diseased, broken and/or rubbing branches 1½ inch or greater in diameter.

- ▶ Remove branches that have included bark or have a high potential of developing included bark later in the growth cycle.
- ▶ Temporary lower trunk branches should be retained or reduced on newly planted trees to improve trunk taper. The lower branches shall be removed at the appropriate time as the tree matures to avoid large pruning wounds.
- ▶ Interfering, over-extended, dead, defective, stubby, weak, broken, hanging and poorly attached branches and basal suckers shall be pruned or removed.
- ▶ The weakest, most damaged of a pair or group of rubbing branches and/or included bark branch structures shall be removed. Leave the most desirable branch if the structural soundness has not been compromised.
- ▶ Interior desirable branch shall remain.
- ▶ Selective water sprouts shall be removed, leaving water sprouts that can be trained into structural branches in a pruning maintenance program.

### **Eco**

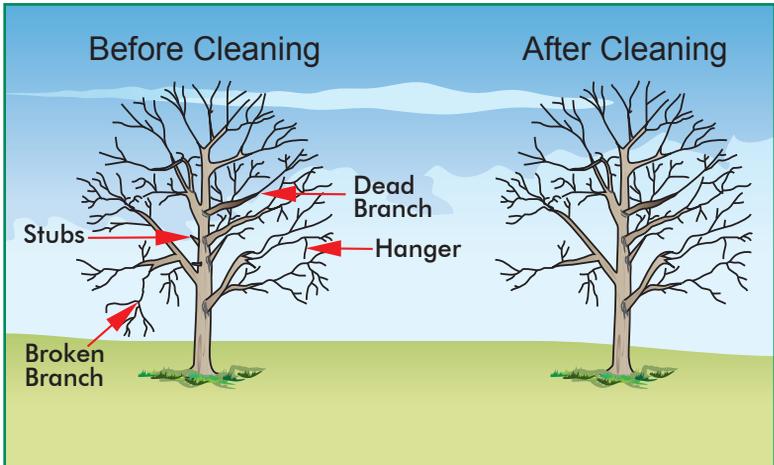
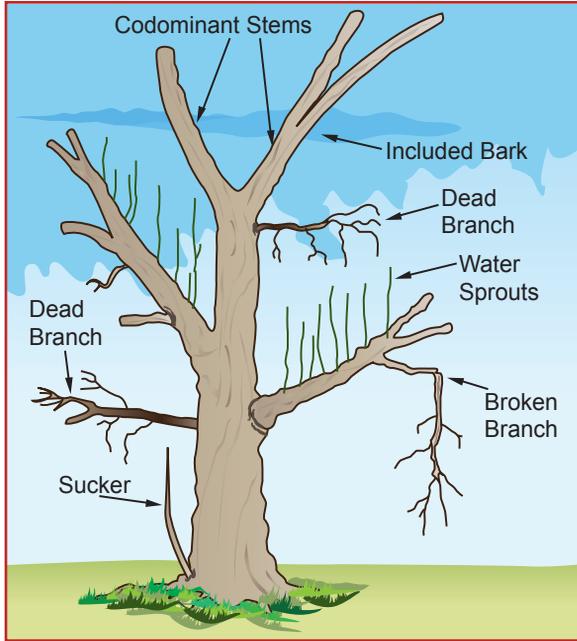
General guideline for pruning: remove no more than 30% of the total crown. This guideline may vary depending on tree species, age, health and structural condition.



### **Remember**

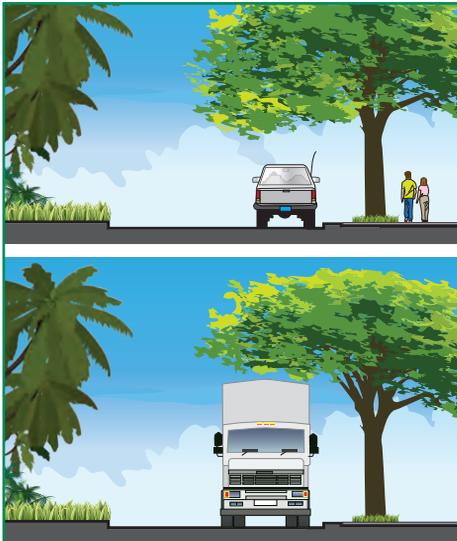
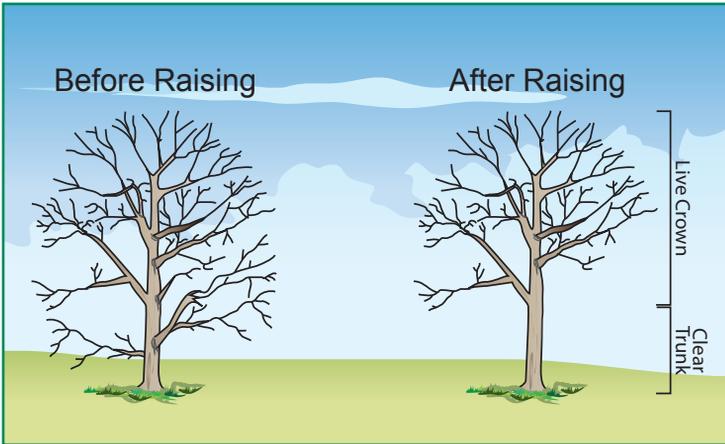
HDOT requires crown cleaning to include crown raising for traffic clearance height requirements.





**3. Crown raising and directional pruning:** Provide clearance for roadway, sidewalk, lights, signs, buildings, utilities, etc. Crown raising and directional pruning shall consist of all pruning procedures of crown cleaning, plus providing vertical and horizontal clearance:

- 17 ft. over roadways
- 7 ft. over sidewalks
- 10 ft. from signs, buildings and light poles



Clearance for signs, building, lights and utilities shall incorporate the following Shigo 90-3-90 principle whenever possible:

**Tip**

**Shigo 90-3-90 Principle**

90% of the time

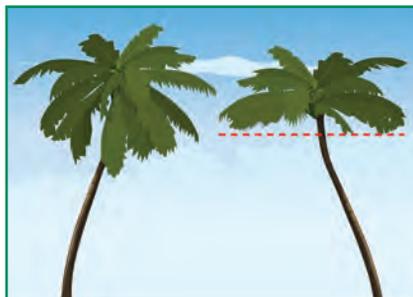
3 branches can be removed to provide

90% of the clearance.



**4. Palm pruning:** Coconut, royal, date and other single-trunk palms.

- ▶ Coconut palms in high traffic and urban areas shall be pruned at least twice per year.
- ▶ Report abnormal conditions in the crown, trunk or base.
- ▶ Remove fronds, fruit, seedpods and fruit stalks carefully without damaging the trunk or fronds that are to be retained.
- ▶ Remove lower fronds where any part of the frond hangs below a horizontal plane if desired (see illustration below).
- ▶ Do not remove live, healthy fronds above horizontal plane except where encroaching on utilities or structures.
- ▶ Do not embed the cutting tool into the trunk or fronds that will remain on the palm.
- ▶ Avoid the use of spikes; use aerial lifts where practical. In most instances on coconut and date palms, damage from repeated spike use is primarily cosmetic, but structural defects may develop over time.



**5. Removals:** Cut to ground and stump grinding.

Large tree and multiple tree removals shall be planned sufficiently in advance to notify the proper agencies, public and community groups impacted by the removals. A safe efficient work plan shall be presented to the Engineer for approval prior to work commencing. Special emphasis shall be placed on safety. Trees shall be completely removed to ground level as quickly as possible. Leaving standing trunks and scaffold branches more than 24 hours is unacceptable.

Tree designated for removal shall be cut as close to the ground as possible. Final stump cuts shall be level with the ground terrain. Treat stumps with Milestone® herbicide after final cuts. Tree gaffs (spikes) may be used on tree removals.

Stump removal shall be done with mechanical stump grinder where feasible and requested by the Engineer. Stumps and surface roots shall be ground eight inches below ground level, area to be back filled with soil, and re-vegetated, per Engineer's approval.

**Eco**

Do not allow invasive, volunteer or unwanted small trees and shrubs to establish in landscape maintenance zones (LMZ) (see Chapter 3, "Landscape Maintenance Zone, Distances and Heights").



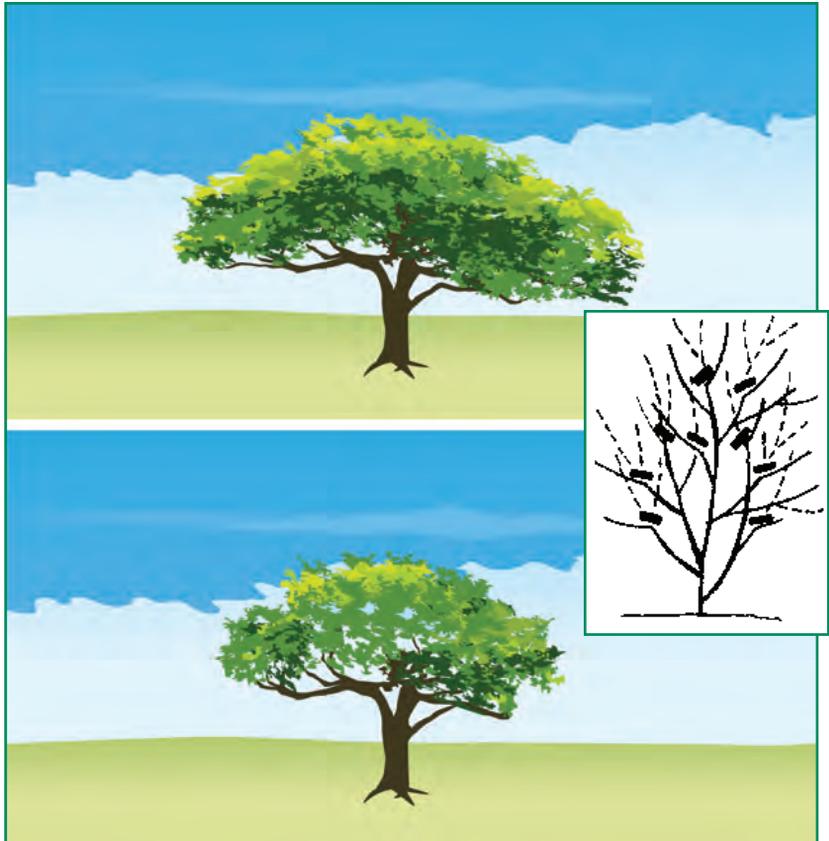
*Aerial lift*



*Stump grinder*

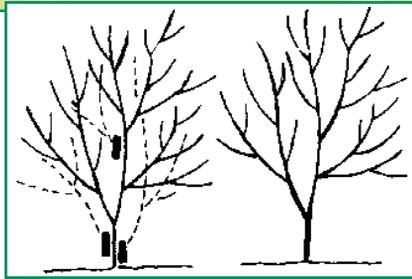
**Additional pruning procedures not used regularly on State highway rights-of-way. The State Engineer may request the following:**

- 6. Crown reduction:** This procedure shall consist of crown cleaning plus selective pruning to reduce height and/or spread. This pruning is used to contain trees at a desired height and spread and requires a regular maintenance pruning schedule. Not more than 25% to 30% of the crown should be removed.



*Crown reduction*

**7. Crown thinning:** This procedure shall consist of crown cleaning plus selective pruning to reduce the density of live branches. Thinning should result in an even distribution of branches throughout the crown. Not more than 25% to 30% of the crown should be removed.



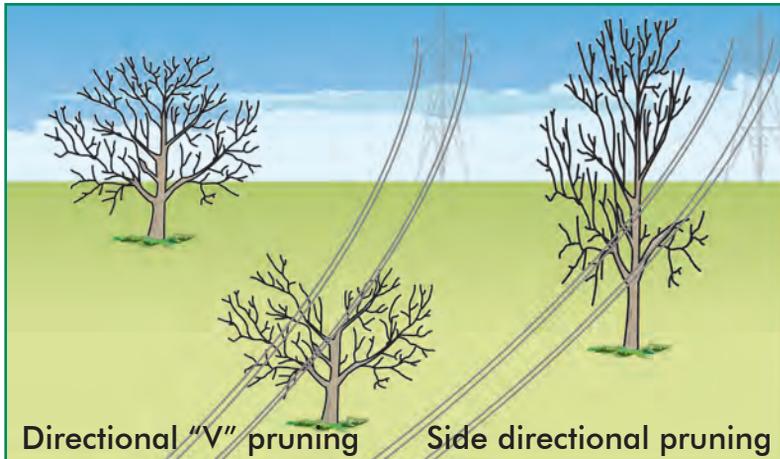
*Crown thinning*



**Remember**

HDOT requires crown reduction and crown thinning to include crown cleaning.

- 8. Restoration pruning:** Consists of selective pruning to redevelop structure, form and appearance of severely pruned, vandalized and damaged trees. Restructural pruning requires regular repeat pruning and monitoring.
- 9. Utility pruning:** Prevents the loss of electrical services, complies with mandated clearance laws, prevents damage to equipment, maintains access and upholds the intended usage of the facility/utility space while adhering to accepted tree care performance standards.



**Shigo  
90-3-90**

90- 90% of the time

3- 3 cuts

90- remove 90% of the branch conflict

Only a qualified line clearance Arborist or line clearance Arborist Trainee shall be assigned to line clearance work in accordance with ANSI Z133.1, 29CFR 1910.331-335.

**Disposal of Debris** (NOTE: Included with A300 or contract requirement)

- ▶ Contractor shall remove debris at the end of each workday.
- ▶ Work areas shall be raked and all debris blown off the road surface.
- ▶ Tree trimming wood and leaves shall run through a sharp chipper and may be spread to a depth of 3 inches in a 5-ft. radius around trees.
- ▶ Wood chips shall be kept 6 to 12 inches away from tree trunks.
- ▶ Excess mulch and all other debris shall be hauled away daily and disposed of at an approved site that meets local ordinances and regulations.

## Unacceptable pruning includes

**Topping and stub cuts:** Reduction of tree size using internodal cuts without regard to tree health or structural integrity. Topping or cutting limbs back to stubs is not an acceptable pruning practice. ANSI A300 (Part 1)-2008 Pruning. Negative repercussions may occur from this type of pruning (decline, death or poor branch connections). Other pruning methods should be explored prior to using stub cuts.



There are many reasons to avoid this type of severe limb removal. Topping is not an accepted pruning method and qualified arborists avoid topping. Reduction cuts, stub cuts and subordination are the recommended methods for reducing the canopy of mature trees.

Topping destroys the natural form of a tree. It may result in rapid re-growth of thick bunches of water shoots near the cut ends of the branches or often over the entire length of the remain-

ing branches. This new growth is usually poorly attached to the parent branch stumps and tends to fail as the new growth gets larger. The open ends of the large cut wounds will not callus properly, which will lead to decay in the area of the poorly attached new growth. This may result in a serious safety issue.

**Lion's tailing:** Poor pruning practice in which an excessive number of branches are thinned from the inside and lower part of specific limbs or a tree crown, leaving mostly terminal foliage. Results in poor branch taper, poor wind load distribution, and a higher risk of branch failure.



## Special Pruning Situations

Roadside hau trees are fast growing with a tangled, intertwined branching pattern, making proper pruning cuts difficult. Hau growth along the roadside creates an impenetrable barrier. Pruning to preserve the barrier and develop an efficient maintenance program is a challenge. Long-term maintenance requires a combination of procedures.

1. The initial use of a side-mounted mower will cut and dispose of heavy overgrown hau; however, it leaves unsightly rips and tears.



*Side-mounted mower*

2. An immediate follow-up crew with aerial lifts, chain saws and pole power saws shall remove damaged branches with clean cuts.



*Chain pole saw in operation*



*Chain saw operator in a boom lift*

3. Schedule pruning two to three times per year. Maintenance crews with both hand- and pole-powered hedge trimmers in combination with a tractor-mounted hedge trimmer shall maintain the barrier. This will reduce severe pruning and provide a nice pruning appearance.



## What are basic tree risk assessment awareness guidelines?

**ISA Certified Arborist shall conduct a visual risk assessment inspection on all trees on job sites for indications of risk/hazard situations and provide a written report with recommendations for tree defects outside contract requirements.**

All landscape and tree pruning personnel working on State rights-of-way shall be aware of basic defects in trees that could injure employees or public and/or damage property, vehicles or hardscapes. All personnel shall be trained in how to identify basic defects and who to contact to inspect and provide mitigation recommendations.

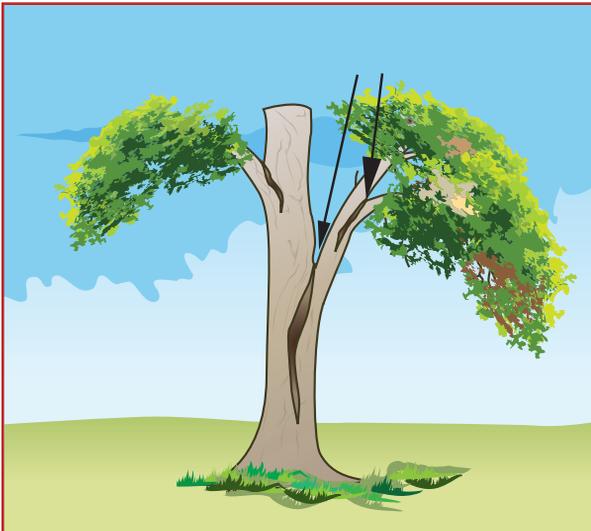
A critical part of conducting tree risk assessment is determining and defining the "Target." What will be damaged or injured if a tree fails? Can the target be moved or removed? How often is the area used?

### Eco

If there is NO Target, there is NO Risk.



### Beware of these defects:



*Deep, open cracks below co-dominant stems, included bark, trunk and/or branches*



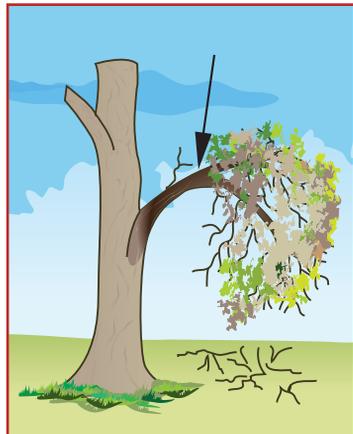
Trees with an excessive (30°-40°) lean and a target



Leaning tree with recent root lifting, soil movement, mounding, or cracks in soil surface



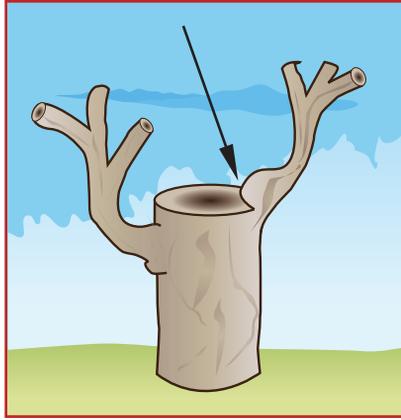
Broken or lodged branches; dead tree, log, or large branches



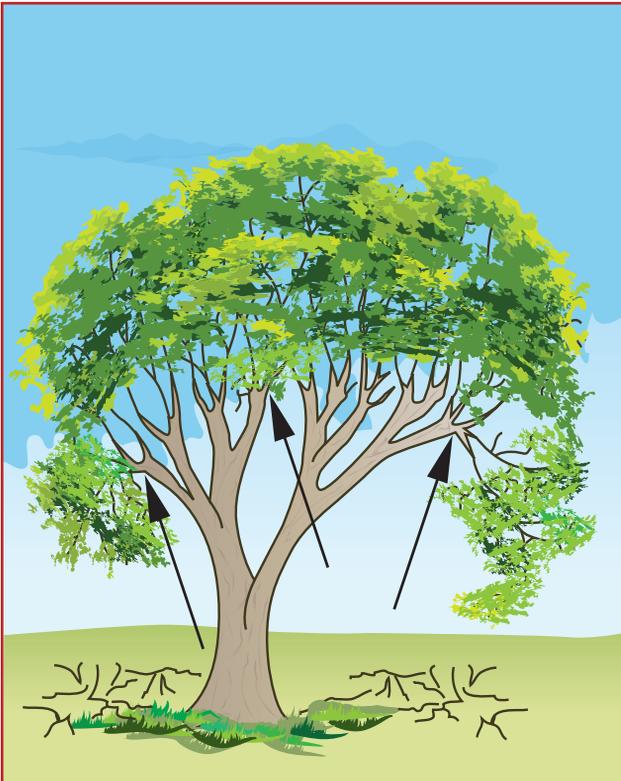
Dead tops or branches; dead tree



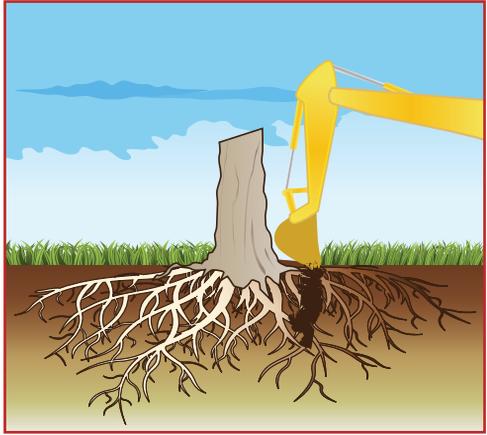
Branch pullout on topped tree



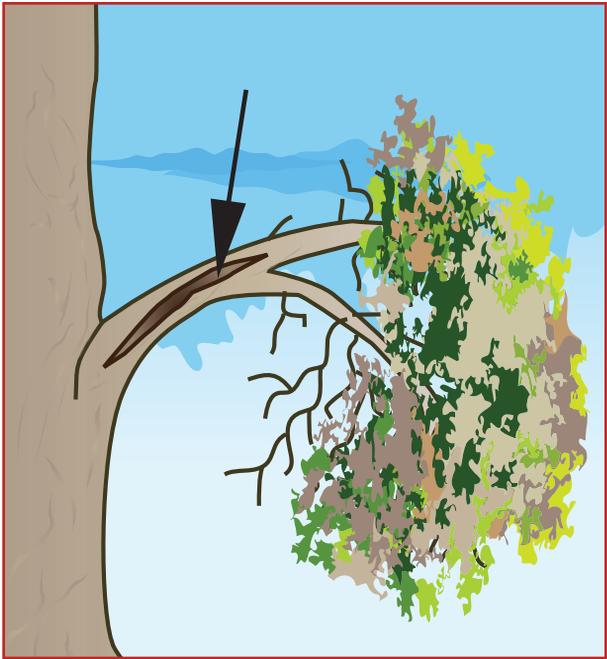
Weak sprout attachment on topped tree



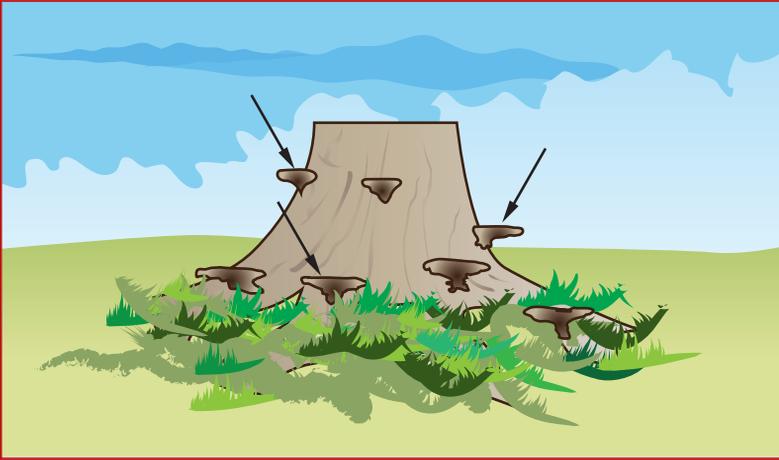
Weak branches growing rapidly from topping cuts on big trees



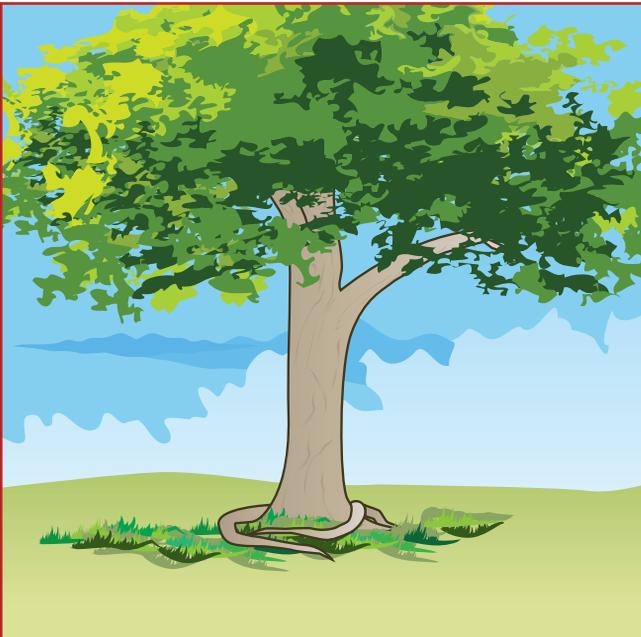
*Root damage after construction – root damage reduces structural stability and may develop into decay*



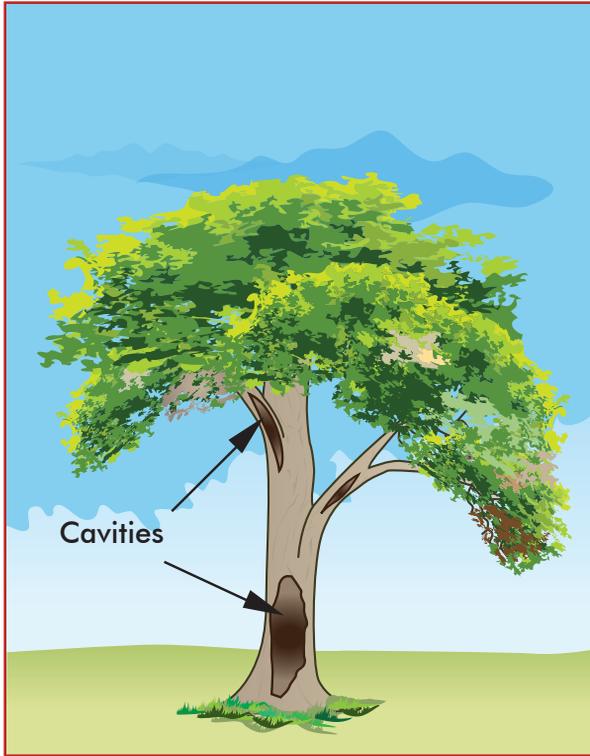
*Broken or cracked branches*



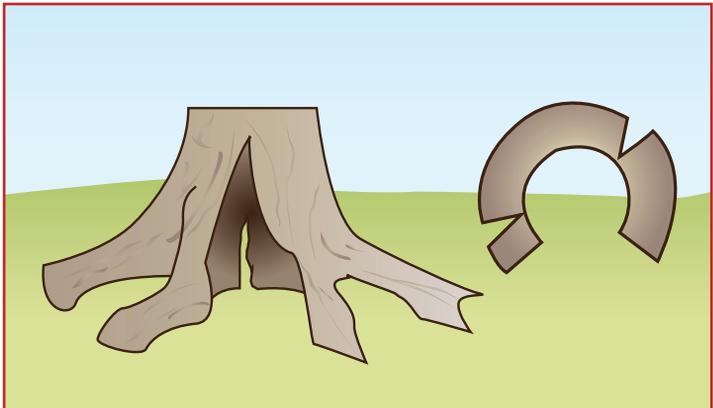
*Fungal bodies – mushrooms – on roots or at base of trunk indicate root rot*



*Tree with constricted lower trunk and/or girdling roots around 40% or more of the root collar*

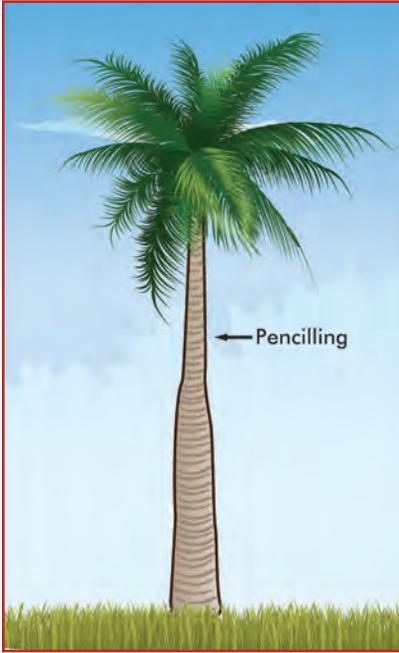


*Hollows or cavities in tree trunks and branches*

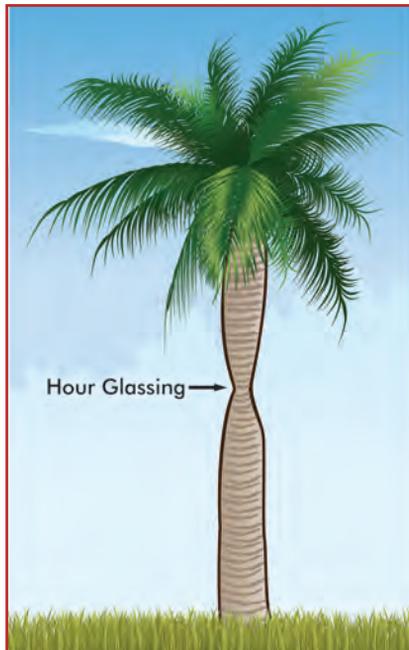


*Trunk with one or more cracks, decay, or cavity (opening)*

## Palm defects



*Palm defect –  
penciling in upper trunk*



*Palm defect – hour-glassing*



## What are the pruning guidelines for shrubs, hedges and native planting?

Shrubs are often used as a single specimen, planted in natural groups in a planting bed or in tight rows to form a hedge.

### Shrub Management

#### Pruning single shrubs or hedges for the informal or open appearance

Shrubs may be pruned by reduction cuts or thinning cuts. Shrubs with large leaves or showy flowers are best pruned by selective reduction cuts that remove terminal ends of young branches back to a lateral bud or node. This is usually done to reduce plant size and keep it within the boundary of the design while maintaining the natural shape of the shrub. This technique usually increases the number of shoots and leaves, producing a denser plant. This is called **informal or open** pruning and can be used on single shrubs or those forming a hedge.

New growth usually is vigorous and upright and develops two or more buds located just behind the pruning cut. Reduce shoots to several different levels within the shrub canopy to produce more natural, fuller looking shrub.

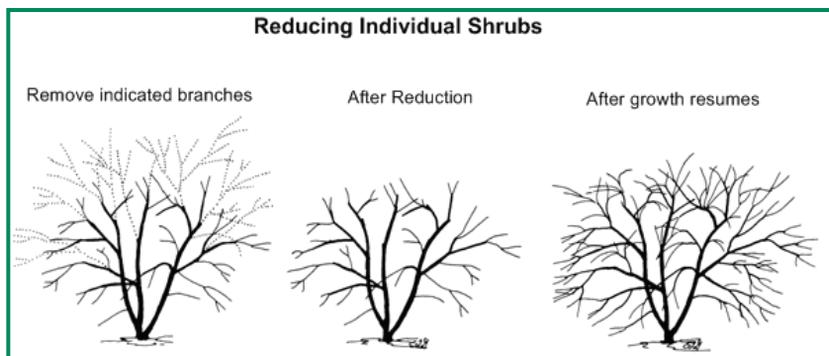
#### Pruning Individual Shrubs

Prune shrubs to maintain the natural form of the shrub and to keep the shrub from outgrowing its planter space. Use reduction cuts with hand-held bypass shears or loppers.

- Remove dead stems.
- Remove or cut back stems that extend far beyond the edge of the crown.
- Reduce 1/3 of the remaining stems (the oldest third) to about 4 to 6 inches inside of the crown.
- Pruning cuts shall be made inside the shrub crown to minimize visual impact.
- Exercise care during thinning to avoid damaging the nearby younger stems and foliage.

**Native shrubs** (other than naupaka; for naupaka see below)

- Prune native shrubs as individual shrubs to natural form.
- Do not prune other than to remove dead branches and encroachments into areas outside of planting area.



**Pruning Hedges**

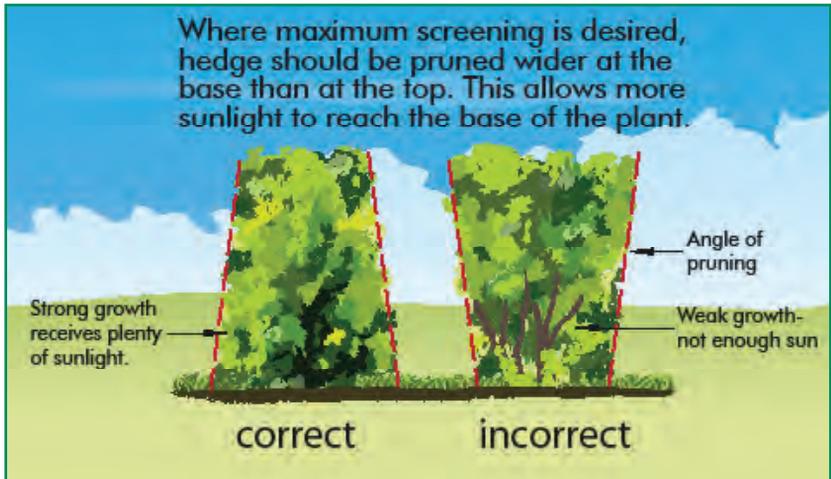
Hedges serve various functional and decorative purposes in residential landscapes. To establish a hedge from newly planted shrubs, tip pruning is required for several seasons. Until the plants reach the desired height, reduce new shoots 1/3-2/3 of their length each time they grow 6-12 inches. This develops a dense, low branching structure and encourages the plants to spread.

Hedges can be pruned in the open, informal style as described above or in the formal, sheared style depending on the species of shrub.

**Formal Hedges**

Hedging or shearing is a type of heading back technique used for a controlled shape. Shrubs with small leaves that lack large showy flowers are normally sheared in formal shapes.

- Maintain hedges so that the base is wider than the top to allow adequate sunlight to reach lower foliage.
- Use hedge trimmers for pruning roadside hedges.



- Maintain formal hedges by regular shearing into defined geometric shapes, such as a box, a square or a ball.
- Perform shearing while new growth is green and succulent but after growth has slowed.
- Shear new growth to within approximately 1 inch of the previous shearing cuts to maintain foliage on the outer edge of the hedge.
- When the formal hedge becomes too large for its planting space, cut back into the older growth. Conduct this severe pruning just prior to the species' primary growth spurt of the year to minimize the period of time when the plant will be bare and unattractive.

### **Naupaka** (*Scaevola taccada*)

Naupaka hedges are common roadside landscapes in Hawaii.

With large succulent leaves and woody vine-line stems, naupaka should most properly be pruned in the informal, natural mode using hand pruners and loppers. However, this is not practical for large roadside plantings.

- Maintain large groupings of naupaka as formal hedges by shearing.



*Naupaka hedges are commonly used for roadside landscapes in Hawaii*

**Bougainvillea** (*Bougainvillea* sp.)

- Maintain bougainvillea as formal hedges by shearing, whether planted in groupings or individually.



## **Renovation of old shrubs and hedges**

Renovation pruning can restore new healthy growth to overgrown shrubs and hedges.

- Perform renovation only on severely overgrown shrubs and when authorized by the Engineer in writing.
- Renovation consists of severely pruning a shrub back so that only its main structural branches remain. Heading cuts are authorized for the purpose of shrub renovation.
- Perform renovation only on healthy, hardy shrubs that are likely to survive, such as naupaka and bougainvillea.
- Do not renovate native shrubs, other than naupaka.

### **Palm clusters**

Pruning small palm clusters, such as areca and MacArthur palms, requires minimal maintenance.

Such clustering palms shall not be pruned except to remove:

- Stalks protruding into the LMZ or obstructing drivers' line of sight
- Dry, hanging leaves
- Seedpods
- Fallen leaves
- Dead or declining stalks

## Reporting & Inspection

You are required to report the time and effort spent pruning trees, palms, shrubs and hedges, as well as safety concerns to the Engineer. Your work will be inspected for precision, appearance, safety and proper permitting. See Chapters 14 and 15.



## In a Nutshell

1. Pruning in the right-of-way is all about safety. Only prune when needed.
2. Recognize a branch bark ridge and collar. Do not damage them when pruning.
3. The 3-cut method of pruning is HDOT's standard practice.
4. Hazard tree reporting is a new HDOT requirement: a "Target" defines a risk of injury/damage to persons/property should a tree fail and is essential for determining a "Hazard."
5. Before you start pruning, stand back and think about what you are about to do.