

CITY OF PALO ALTO  
**TREE TECHNICAL MANUAL**  
STANDARDS AND SPECIFICATIONS

notes:

## **SECTION 4.00 HAZARDOUS TREES**

### **INTRODUCTION**

Property owners are responsible for the trees on their own property. The City does not require advance permission for removal of Protected or Designated Trees in emergencies. However, it does require documentation of the problem after the fact. This is to avoid the unlawful removal of sound trees on the grounds that they are hazardous. If there is no immediate danger, and the structural deficiency can be corrected, it should be. If the City determines that there was no reasonable basis for believing there was an emergency, the property owner may face penalties for violating City law.

The health and safety of a tree are two distinct and separate functional characteristics. A vigorous and healthy tree may not necessarily be of sound wood or structure. To remove a dangerous *protected or designated tree*, it must first be evaluated and the tree determined to be “*hazardous*” as defined in this section. This must be verified in writing by the *City Arborist* before the tree can be removed. (see also *Removal, Replacement and Planting Trees, Section 3.00, and ISA Hazard Evaluation Form, Section 4.20 B*).

#### **A. Tree Hazard Responsibility**

On private property, it is the responsibility of the property owner to mitigate or abate a known hazardous condition of a *protected or designated tree* that may be of questionable structure or deemed as hazardous. Most tree hazards can be prevented with regular checkups by a tree care professional and timely maintenance action by the property owner. Street trees on city property that may be a public safety hazard should be reported to the City of Palo Alto, Public Works — Operations at (650) 496-5953.

#### **B. Recognizing Tree Hazards**

Determining whether or not a tree’s defects constitutes a condition that presents an imminent hazard to an area requires a high degree of knowledge and experience. Hazard tree assessment of a *protected or designated tree* should only be evaluated by an arborist who is familiar with tree physiology and can interpret the external signs of weaknesses, who can perform internal checks if necessary and recommend mitigation (see *Hazard Reduction and Prevention, Section 4.40, and Hazard Evaluation Form, Section 4.20 B*).

Required Practices

## **4.10 EMERGENCY REMOVAL CONDITIONS**

#### **A. Abatement**

When a tree has partially failed or it is apparent it is about to fail and persons or property are threatened the tree may be removed without City review or approval. The City does not require an arborist report before the removal in this instance.

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**B. Authorization**

Such cases must be substantiated after the fact by the property owner and tree professional with photographs, abatement information, insurance claim or other relevant information and completion of a Protected Tree Removal Application. The information is to be submitted to the City Planning Division Arborist within five days of emergency *removal*. All other authorizations are subject to the standard procedure outlined in *Removal of Protected Trees, Section 3.05*.

Required Practices

**4.20 CRITERIA USED BY THE CITY TO DETERMINE IF A TREE IS HAZARDOUS**

**A. Definition of Hazardous**

Palo Alto Municipal Code Chapter 8.10.020 defines 'Hazardous' as: an imminent hazard or threat to the safety of persons or property. If a tree possesses a structural defect that may cause the tree or part of the tree to fall on someone or something of value (i.e. 'target'), and the condition is determined to be imminent, the tree is considered *hazardous*.

**B. Evaluation Form**

The City uses the national standard, an ISA - HAZARD EVALUATION FORM (see Appendix C) as a basis to determine the hazard rating of a tree (see Hazard Rating, Section 4.25). This form, or an approved equivalent, must be completed by a *certified arborist*. The *City Arborist* retains discretionary right to approve, request in writing a second opinion of a rating, in writing, or recommend action that may reduce the condition to a less-than significant level of hazard.

**C. Authorization**

If the *hazardous* condition or *target* cannot be mitigated or reduced to a less than significant level (see Hazard Reduction and Prevention, Section 4.40) then the tree shall be authorized by the City and removed by the property owner to abate the condition.

Required Practices

**4.25 DETERMINING A TREE'S HAZARD RATING**

For the purpose of removal, if a tree is declared a hazard it must be rated for the level of hazard to persons or property by using the Hazard Rating Formula, or other professional methodology acceptable to the City of Palo Alto (see Hazard rating formula Table 4-1 and Appendix C):

**TABLE 4-1**  
Hazard Rating Formula

<b>ISA - HAZARD RATING FORMULA</b> International Society of Arboriculture			
<b>Failure Potential</b>	<b>+ Target</b>	<b>+ Additional Factors/Size of Part</b>	<b>= Hazard Rating</b>
	<b>+</b>	<b>+</b>	<b>=</b>
<b>1 = low</b> <b>4 = severe</b>	<b>1 = low</b> <b>4 = severe</b>	<b>1 = low</b> <b>4 = severe</b>	<b>3 = low</b> <b>12 = severe</b>

Note: The above factors are combined to quantify a hazard rating. For example, a minimum rating of 3 is the safest (a low predicable hazard), and the maximum rating of 12 is an imminent hazard (a high predictable hazard). Further details regarding this formula can be found in the ISA- HAZARD EVALUATION FORM (see Appendix C) and the ISA publication \* Evaluation of Hazard Trees in Urban Areas, most current edition.

**A. Failure Potential Rating**

Failures do not occur at random, but are the result of a combination of defects and aggravating conditions. The scope of the professional evaluation will include structural defects in the tree ( including branches, trunk and roots; and if necessary, shall employ the use of the most current methods of internal decay inspection available); soil/slope and/or creek bank stability; individual species susceptibility to failure; pruning; history; decay weaknesses and any other compromising or pertinent factors considered by the consultant.

**B. Target Rating**

Evaluation of potential targets shall include people, structures or property use and occupancy that are imminently threatened. Property use shall consider what structures or activities are under or around the tree (e.g. building, parking, pedestrian, recreational, utility lines, hardscape, etc.). Occupancy shall consider frequency of the use (occasional, intermittent, frequent or constant), and whether the *target* will be present when failure occurs.

- ▶ Consideration shall be given as to whether the *target* can be reasonably removed or isolated to reduce the hazard rating to a less than significant level. A target means people or property (public or private).
- ▶ A tree may be a potential hazard if it is: (a) a tree with the potential to fail; (b) in an environment that increases the likelihood of failure and; (c) a tree that would strike a *target*.

**C. Additional Factors**

Evaluation of other factors that contribute to aggravating conditions shall be considered, such as: size of the affected defect (i.e. a small branch vs. the entire tree uprooting); significant potential of fire, utility line contact or catastrophic effects, etc.

**4.30 TREE EVALUATION CHECKLIST**

This part is intended to further help the property owner understand tree defects and how they may be interpreted by an arborist. Many tree defects are not readily apparent because decay or structural damage may be internal. Also, poor tree health may not reflect poor tree structure. *Hazardous* trees must be carefully evaluated. The following checklist of criteria that is typically used by professionals may indicate potential or current tree hazards. The checklist is not meant to be a comprehensive guide, however, it is an outline of indicators that may alert a property owner to potential hazards and suggest action to avert a tree failure and liability. If you answer 'yes' to one or more of the checklist items, you should contact an arborist to discuss how to reduce the potential hazard.

**A. Hazard Evaluation Questionnaire**

- ▶ Target: If the tree or branch falls will it hit cars, houses, structures, power lines or people? If so, immediate action may be necessary.
- ▶ Dead Branches: Are there dead tops or branches? Is the tree dead?
- ▶ Cracks: Are there deep, open cracks in the trunk or branches? These are major starting points for trunk and branch failure.

Recommended Practices

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- ▶ **Crotch Cracks:** Are there deep, open cracks below joining trunks or stems?
- ▶ **Tree Architecture:** Has the tree grown beyond its species specific shape into a hazardous form? Is the tree leaning?
- ▶ **History:** Has the tree recently lost large branches?
- ▶ **Edge Tree:** Were neighboring trees recently removed, leaving tall trees exposed at the edge that may be subject to unexpected wind dynamics and blow-over?
- ▶ **Living Branches:** Do live branches bend abruptly upward or downward where tips of large branches were cut off? These may pull out of trunks that are weakened by rot or cracks. Beware of large branches on rotten or cracked trunks.
- ▶ **Topping:** Are large branches growing rapidly from topping cuts? These sprouts have weak attachments and may weaken further as they grow. Is there decay below topping cuts?
- ▶ **Storm injury:** Are there broken branches, split trunks, or injured roots? Are branches close to power lines?
- ▶ **Root Rot:** Are there fungus fruit bodies (mushrooms) on roots or near the trunk? Were roots injured by construction?
- ▶ **Rots and Cankers:** Are there hollows or cankers (dead spots) in the trunk or major branches, some with fungus fruit bodies?
- ▶ **Construction injury:** Have roots, trunk, or branches been injured?
- ▶ Is there a new lawn or garden over injured roots? The added fertilizer may stimulate the growth of fungi that will rot the supporting roots while the top gets heavier. A moderate storm could cause the tree to fall.
- ▶ **Guying of trees.** Staking and guying of small to medium size trees may benefit from the additional support. Discretion must be exercised that the guying does not hide weaknesses, such as toppling over, that result from poor quality nursery stock or girdling roots.

#### **4.40 HAZARD REDUCTION AND PREVENTION**

Review the following list to reduce hazardous conditions.

- ▶ Plant trees that are not problematic and that fit the site  
The International Society of Arboriculture (ISA) has developed a list to assist you to avoid planting a tree that may become a problem (*see Inherent Failure Patterns for Selected Species, Appendix D*).
- ▶ A healthy, vigorous tree that receives regular care is less likely to become *hazardous* than one that is ignored. Prevention is the best solution to the tree hazard problem.
- ▶ The risk of a hazard tree may be reduced by removing dead and broken branches, reducing branch end weights, by mechanically supporting weak branches from below, or by cabling and bracing.

Recommended  
Practices

In some cases, *targets* may be removed such as by moving picnic tables or other items beneath a precarious tree, fencing to prevent access to such trees, or rerouting pedestrian or vehicular traffic.

- ▶ If there are no other options to abate the hazard, the tree may need to be removed entirely (see *Removing a Hazardous Tree, Section 4.10*). Steps outlined in the Tree Removal Procedure (see *Section 3.05*) should be submitted as soon as possible for review by the City.

The following checklist will help property owners avoid future problems:

- Inspect your trees carefully at least once each season every year. Annually, have a *Certified Arborist* inspect your trees and provide you with a written report.
- Avoid planting brittle species where falling limbs could injure people or property (see *Inherent Failure Patterns for Selected Species, Appendix D*).
- Prune trees when they are young (see *Pruning Young Trees, Section 5.30*) and regularly thereafter.
- Use correct pruning methods, always making the pruning cut outside the branch collar. This will allow only the minimum of decay infection.
- Do not allow *topping* (see *Definition, Section 1.32*).
- Always plant the right tree in the right place. Select trees based upon their mature height and shape, and make sure the species selected matches the soil and other site characteristics. For example, avoid planting tall-growing trees such as redwoods near power lines or too close to your house (see *Inherent Failure Patterns for Selected Species, Appendix D*).
- Water thoroughly (generally, until saturation is reached) during dry periods, slowly applying at least 2-inches of water per week (see *Watering, Section 5.45*).
- Erect barriers around or slightly beyond the root protection zone of trees during construction. Insist that these root protection zones be honored by construction workers.
- Consider cabling or bracing weak forks of branches in larger trees of high value.
- Do not plant trees with a narrowly-forked stem v-crotch, imbedded bark or girdling root ball.
- Where a valuable specimen tree may be suspected of developing into a *hazardous* tree, use landscaping to keep people at a safe distance. This may require techniques such as rerouting walks, moving patio furniture, or planting shrubs and hedges to function as barriers to keep foot traffic at a safe distance (see *Determining if a Tree is Hazardous, Section 4.20*).



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