*SBCA TREE CONSULTING*
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Date: August 25, 2014

To: Todd Williams, Public Works Supervisor
City of Alameda

Subject: Tree Safety

Location: 1700 Block of Chapin

Species: American Sweet Gum *(Liquidambar styraciflua)*

Assignment: Arborist was asked to comment on the health, safety and future viability of four *Liquidambar* trees located on the 1700 block of Chapin

## Introduction

Arborist reviewed three of the *Liquidambar* trees in on Chapin in 2007 (#1704, #1720, and #1728). At that time, it was noted that the trees appeared to be problematic for a number of reasons. It was recommended that the trees be removed and replaced over a number of years. Since that time, the tree at #1704 has been removed. There is concern for unnecessary tree removal because the trees provide raptor habitat.

Since 2007, one tree dropped a significant limb. Arborists were asked to reevaluate tree safety.

## Summary

It is recommended that all *Liquidambar* trees on the block receive advanced decay assessment. One tree (#2, 1710 Chapin) is recommended for removal and potentially two additional trees (#4, 1720 and #4, 1728) may require removal pending decay investigation.

Recent visual inspection and using a mallet to sound for decay identified tree safety concerns due to prior branch removal and breakouts. Most of the *Liquidambar* trees have root-hardscape conflicts and possible main sewer line obstruction.

Full assessment requires an aerial inspection of the scaffold and upper crown. Such an inspection must be part of all future pruning of these trees and undertaken prior to pruning. Trees found to be problematic can be either removed or pruned more severely as deemed appropriate.

## Tree and Site Description

All trees are City Street Trees and growing in parkway planting strips between the sidewalk and the curb. All trees are considered to be mature with heights up to 85 feet.

**Table 1.**

Table below provides tree descriptions and arborist notes and recommendations for the 1700 block of Chapin.

| | Address | DBH | Health | Structure | Notes | Recommendations |
|---|---|---|---|---|---|---|
| **1** | 1700 | 28” | Good | Fair-Poor | Topped; Tree lean; Curb displacement; Headed; Included bark in upper scaffold; 2008 Sidewalk repairs; Internal decay; | Aerial Decay Inspection; Minor End Weight Reduction |
| **2** | 1710 | 25” | Fair-Good | Poor | Topped; Large pruning wound; Major curb/gutter/sidewalk displacement; Rotten stem over path; Internal decay | Remove rotten limb; Consider Removal |
| **3** | 1716 | 24” | Good | Poor | Topped; Girdling root; Major curb/gutter/sidewalk displacement; Included bark on scaffold branch; Internal decay | Aerial Decay Inspection; End Weight Reduction on Included Bark stem |
| **4** | 1720 | 43.5 | Good | Poor | Topped; Major included bark breakout; Curb/gutter/sidewalk displacement; 2008 pavement improvements; Recent large limb failure (over-weight); Internal decay | Resistograph Trunk; Aerial Decay Inspection; Consider Removal |
| **5** | 1728 | 37” | Good | Poor | Topped; Roots in street; Major decay in upper scaffold; Curb/gutter/sidewalk displacement; Internal decay | Aerial Decay Inspection Consider Removal |
| **6** | 1723 | 27” | Good | Poor | Codominant with included bark; Included bark in upper scaffold Rubber sidewalk; Minor curb displacement; Internal decay | Minor End Weight Reduction on Included Bark stems; Aerial Decay Inspection |
| **7** | 951 Pacific | 28.5” | Good | Poor | Topped; 2007 pavement replacement; Internal decay | Aerial Decay Inspection; Minor End Weight Reduction |

## Discussion

Large Old Trees – Mature and over mature trees are more problematic with regard to crown safety and root related maintenance. Larger trees require ever increasing levels and frequency of maintenance. The problems are compounded when trees are improperly maintained during the early years. Large pruning wounds offer easy entrance for decay organisms into the scaffold structure.

Increased Pruning Maintenance Requirements – Mature trees that have suffered large pruning wounds or that have inherently weak stem attachments (included bark) require more frequent pruning. When the pruning treatment is inappropriate or improperly administered, the future maintenance needs and future safety liability are adversely impacted. *Liquidambar* trees are known to have more brittle or weaker wood.

Increase of Root Conflict with Hardscape and Underground Utilities – It is common for the level of root intrusion to increase as trees become larger. Large stature old trees are responsible for the majority of sidewalk, curb and street displacement.

Decay Investigation – There is ample evidence of prior heading cuts, which are known to generate decay. The Tree #4 at 1720 Chapin appeared to be quite hollow when sounded with a mallet. Visual inspection coupled with sounding is the first step in decay investigation. When decay is suspected, more extensive decay examination is undertaken. Visual inspection indicates that all of the *Liquidambar* trees require additional decay assessment.

Remove All Trees – There are points to be made regarding the removal of all of the trees at one time. This would eliminate all tree safety concerns. Sidewalk repairs and under pavement treatments could be undertaken together. More light would be afforded to the replacement trees. However, as Arborists, we are in favor of a gradual transition: removal and replacement of the most problematic specimens first, followed by the eventual removal of all trees. This way, the street can experience less shock when it loses its mature trees.

## Recommendations

Prune or Remove Tree #2 – The large limb over the drive was noted as having extensive decay. This limb will require removal. This tree suffers from the removal of large limbs in the past as evidenced by the large wounds. With the fair health, poor structure, major root-hardscape conflicts and minimal aesthetic contribution, this tree would top the list of removal candidates.

Resistograph #4 – When sounded with a mallet, this tree was noted with significant internal decay in its trunk. Advanced assessment using a Resistograph is recommended to understand the extent of the decay. If the decay is found to be in excess of the safety threshold, the tree should be either removed or pruned in accordance with “crown reduction” pruning guidelines.

Aerial Decay Assessment – It is recommended that any of the *Liquidambar* trees designated for pruning receive an aerial inspection of the scaffold and upper crown. This is conducted prior to pruning. The investigation involves visual inspection, sounding with a mallet, and use of a Resistograph or other tool to accurately assess the level of decay if deemed necessary. Trees of special note for earlier decay assessment are Trees #4 (1720) and #5 (1728). It is recommended that these trees be assessed as soon as it is feasible.

Continue Removal and Replacement – It is likely that one, possibly three of the trees may require removal in the near future. It is recommended that the program to slowly remove the most problematic trees be ongoing and based upon tree safety.

Replacement Species – Recommend replacement using Red Oak (*Quercus rubra*). This is a large stature tree that can offer long term amenities and habitat. Branches are much less brash than the *Liquidambar,* which is known for limb breakage. The Silver Linden *(Tilia tomentosa)* planted at #1704 is also an acceptable species for replacement.

Possible Under Pavement Treatments – Though Alameda has excellent sandy soil conditions, planting trees of large mature size is best undertaken in conjunction with special under-sidewalk treatment. This entails the use of 6-12 inches of clean crushed rock below the pavement. This will prevent future root related pavement displacement and the need for later root cutting. Narrow parkways and those adjacent to irrigated turf will benefit most.

## Photo Supplement

**Photo 1.** *Photo to the left shows the street scape with mature Liquidambar trees. They provide valuable amenities to the block, including shade, beauty, and habitat.*

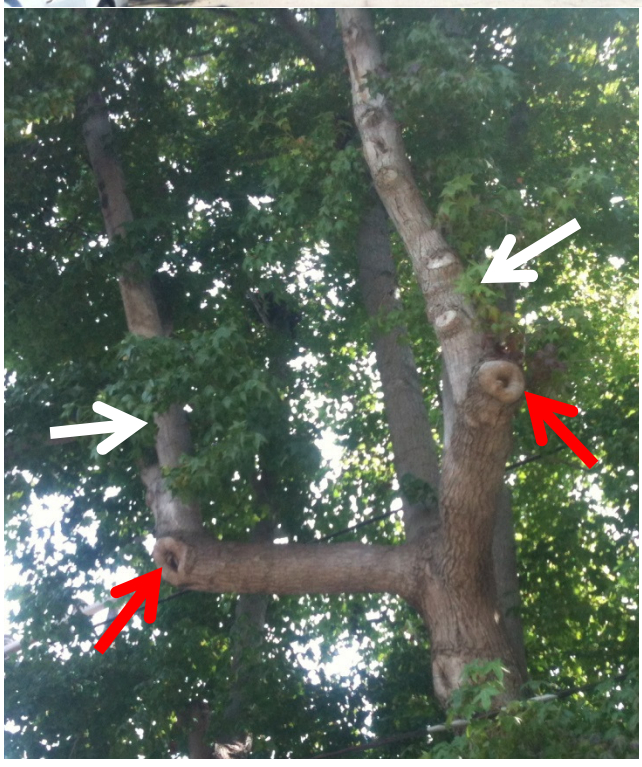

**Photo 2.** *Photo to the left shows Tree #5 at 1728 Chapin. This tree, like all the Liquidambars on the block, were headed the past. Large branches were removed the trees were not able to close the wounds before decay set in (red arrows). Weakly attached new branches developed from epicormic sprouts, which are now very large (white arrows). Investigation to determine the extent of the decay in these areas is necessary to evaluate associated tree risk.*

**Photo 2 and 3.** *Photos to the left and above shows the extensive curb and gutter displacement adjacent to Tree #2 in front of 1710 Chapin. All trees on the block have caused hardscape displacement.*

**Photo 4.** *Photo to the right shows the decay observed on the large branch over the drive at 1710 Chapin (red arrow). Aerial inspections are required for all trees to understand if other branches are significantly decayed.*

**Photo 5.** *Photo to the left shows Tree #6, 1723 Chapin and codominant limbs with included bark between their attachment. These attachments are inherently weak because bark precludes the joining of wood. To mitigate, future pruning should concentrate on one stem to create a disproportionate size between the two stems. Other included bark attachments within the tree canopy should be pruned in a similar manner.*

## End Report

Report Submitted By:

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