CITY OF CHULA VISTA DEPARTMENT OF PUBLIC WORKS

REPORT ON POST-PROJECT TREE RETAINABILITY: CIP STM-382, EAST H STREET PROJECT

PREPARED FOR MR. GREGORY E. TSCHERCH

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NOV 2015

1800 MAXWELL ROAD
CHULA VISTA, CA 91911

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SUMMARY

The City of Chula Vista proposes to widen the portion of the City's East H Street between west of Buena Vista Way and Southwestern College entrance. The project will provide major improvements to the existing bikeway system along East H Street by connecting the one-half-mile gap between existing bikeway facilities along H Street/East H Street/Proctor Valley Road corridor.

In September 2015, Mr. Gregory E. Tscherch, Senior Civil Engineer at City of Chula Vista Public Works Department, requested me to inspect the large eucalyptus trees located on Chula Vista's East H Street, between west of Buena Vista Way and Southwestern College entrance, to determine the retainability of the said trees after the abovementioned road widening project. The inspection of the trees, located on the north and south sides of the road, is to aid the decision to retain the trees beyond the upcoming major road widening project on East H Street.

Based on my visual inspection of the eucalyptus trees, and my consideration of their age, size, location, and present condition, it is my conclusion that any of the eucalyptus trees whose major roots (larger than two inches in diameter) are severed within ten feet of the tree's trunk might pose a significant tree failure risk in the near future if they are retained beyond upcoming major construction activities.

INTRODUCTION

Background

The mixed species eucalyptus trees under discussion are mostly river red gums (*Eucalyptus camaldulensis*), silver dollar gums (*Eucalyptus polyanthemos*), and sugar gums (*Eucalyptus cladocalyx*) which were planted in the mid-1970s to flank East H Street. Subsequent road widening exercises on East H Street over the years have moved the roadways very close to the trees (photographs 1 to 4, 6 to 8).

Assignment

Mr. Gregory Tscherch requested me to evaluate the existing condition of the eucalyptus trees which are growing on both (the north and south) sides of East H Street, between west of Buena Vista Way and Southwestern College entrance. He also requested me to submit a written report, documenting my observations, professional opinion, and recommendations, on the retainability of the said trees beyond the abovementioned road widening project.

Limits of Assignment

On September 18, 2015 and October 29, 2015, I performed visual inspections of the East H Street eucalyptus trees from the ground. Using a diameter tape, I measured the **diameter at**

standard height (**dsh**) of a representative eucalyptus tree located at the northeast corner of East H Street and Buena Vista Way (photographs 4 and 5). I used a tape measure to measure the distance from the base of the representative tree to the back of the adjacent sidewalk (photograph 6). I took several photographs of the trees and the site (photographs 1 to 8). I did not perform any aerial inspection of the trees' **crowns** at any time; I did not conduct any **root crown** excavation, either.

Purpose and Use of Report

The purpose of this report is to present to Mr. Gregory Tscherch my findings and recommendations on the retainability of the subject eucalyptus trees beyond upcoming major road widening work on East H Street, Chula Vista. Therefore, the use of this report will be at Mr. Tscherch's discretion.

OBSERVATIONS

The eucalyptus trees I inspected on East H Street range from 35 feet to 60 feet in height; I recorded a 25-inch dsh on the representative eucalyptus tree I measured at the northeast corner of East H Street and Buena Vista Way. I observed that most of the eucalyptus trees looked very healthy; there were no noticeable evidence of disease or insect infestations on the trees.

During my inspection, I observed that the eucalyptus trees' foliage, branches and branching characteristics, branch attachments, crown density and spread, trunk size relative to tree height and crown density, and recognizable **root flare** at the base of the trees all looked typical for the respective eucalyptus species found in the project area.

Road widening exercises on East H Street over the years have moved the roadways very close to the large eucalyptus trees: many of the trees are located within a distance of six feet from the adjacent sidewalk (photographs 6 to 8).

DISCUSSION

The Eucalyptus Tree

Eucalyptus is a diverse genus of flowering trees and shrubs (including a distinct group with a multiple-stem mallee growth habit) in the myrtle family, *Myrtaceae*. Members of the genus dominate the tree flora of Australia. The more than 700 species of eucalyptus are mostly native to Australia, and a very small number are found in adjacent areas of New Guinea and Indonesia.

Only 15 species of eucalyptus occur naturally outside Australia, with just nine of these not occurring in Australia. Species of eucalyptus are cultivated widely in the tropical and temperate

world, including the Americas, Europe, Africa, the Mediterranean Basin, the Middle East, China, and the Indian subcontinent, though most species do not tolerate frost.

Eucalyptus is one of three similar genera that are commonly referred to as "eucalypts", the others being Corymbia and Angophora. Many species, but far from all, are known as gum trees because they exude copious kino (gum) from any break in the bark (e.g., scribbly gum). The generic name is derived from the Greek words ευ (eu) "well" and καλύπτω (kalýpto) "to cover", referring to the operculum on the calyx that initially conceals the flower (D. Gledhill, 2008).

A mature eucalyptus may take the form of a low shrub or a very large tree. The species can be divided into three main habits.

As a generalization, "forest trees" are single-stemmed and have a crown forming a minor proportion of the whole tree height. "Woodland trees" are single-stemmed, although they may branch at a short distance above ground level. "Mallees" are multistemmed from ground level, usually less than 33 feet in height, often with the crown predominantly at the ends of the branchlets and individual plants may combine to form either an open or closed formation. Many mallee trees may be so low-growing as to be considered a shrub.

Some eucalyptus species have attracted attention from horticulturists, global development researchers, and environmentalists because of desirable traits such as being fast-growing sources of wood, producing oil that can be used for cleaning and as a natural insecticide, or an ability to be used to drain swamps and thereby reduce the risk of malaria. Eucalyptus oil finds many uses like in aromatherapy, as a cure for joint pains.

Eucalyptus trees show allelopathic effects; they release compounds which inhibit other plant species from growing nearby.

Outside their natural ranges, eucalypts are both lauded for their beneficial economic impact on poor populations (J. Luzar, 2007) and criticized for being "water-guzzling" aliens (D. Robertson, 2005), leading to controversy over their total impact (R.L. Santos, 1997).

Tree Root Growth and Spread

The pattern of development of a tree root system is important in providing a tree with a secure supply of nutrients and water as well as anchorage and support.

Major tree roots often grow within a few inches of the soil surface. Some species, such as maples, grow roots particularly close to the surface. Tree roots normally grow outward to about three times the branch spread. Only half of a tree's root system occurs between the trunk and the circumference of its crown.

Effects of Root Removal on Tree Stability

Removing any significant portion or quantity of the roots of a large tree will lead to serious injury to the tree; removal of a significant amount of a tree's roots can lead to the eventual death of the tree. Balance between the tree's crown and root system is important for maintaining healthy trees. When a tree's roots are lost, by any means and for any reason, the resulting imbalance creates stress.

Cutting a tree root that is larger than two inches in diameter or cutting too close to the trunk interferes with the structure and stability of the tree. Roots provide the support necessary to keep a tree standing, and without the support structure, the tree becomes unstable. This can lead to the tree falling over during high winds or rainstorms.

A tree usually has four to seven major (structural) roots, cutting just one of them within a few feet of the trunk can remove up to 25 percent of the tree's root system. Removal of a tree's structural roots, especially close to the tree's trunk, predisposes the tree to failure.

CONCLUSIONS

Based on my visual inspection of the eucalyptus trees, and my consideration of their age, size, location, and present condition, it is my conclusion that any of the eucalyptus trees whose roots are severed within ten feet of the tree's trunk might pose a significant tree failure risk in the near future if they are retained beyond upcoming major construction activities.

RECOMMENDATIONS

I recommend that any of the eucalyptus trees whose major roots (larger than two inches in diameter) are severed within ten feet of the tree's trunk be removed to prevent injury to persons and damage to property in the event of such a tree's failure.

GLOSSARY

Crown – The branches, leaves, and reproductive structures of a tree. The crown extends from the trunk or main stems.

Diameter at standard height (dsh) – A standard method of expressing the diameter of the trunk or bole of a standing tree, measured at 4½ feet above ground.

Root crown – Also known as the root collar, or root neck, is that part of a root system from which a stem arises.

Root flare –The point where the trunk begins to spread out as it meets the roots growing underground. It is the transition zone between the main stem and the root system. The root flare should always remain exposed.

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SUPPORTING MATERIALS

Photograph 1

Photograph 2

Photographs 1 (top; taken from the southwest side of East H Street and Buena Vista Way intersection, facing northeast) and 2 (above; taken from the west side of intersection, facing east) show a section of subject East H Street eucalyptus trees. Representative tree (RT), measured at 25 inches dsh, is arrowed in Photos 1 and 2.

Photograph 3 – A view of subject East H Street eucalyptus trees. Note the full height (estimated at 60 feet) of some of the trees in relation to the height (6 feet) of an adult man (arrowed). Photograph 3 was taken from the west, facing east.

Photograph 4

Photograph 5

Photographs 4 and 5 – Representative tree measured 25 inches dsh.

Photograph 6 – Representative tree (25 inches dsh, 60 feet height) is located 5 feet 10 inches from the adjacent sidewalk.

Photograph 7

Photograph 8

Photographs 7 (top) and 8 (above) show a section of subject East H Street eucalyptus trees and their proximity to the adjacent sidewalk. The trees are located less than three feet from the adjacent sidewalk.