BECKY DUCKLES
CONSULTING ARBORIST & LANDSCAPE ADVISOR
SEBASTOPOL, CA.
707.829.0555 P

ARBORIST'S REPORT

KOWS Radio Tower @ Pleasant Hill Reservoir
1281 Pleasant Hill Ave. - Sebastopol

December 7, 2016

ASSIGNMENT

At the request of Kenyon Webster, Planning Director I visited the site of the City-owned Pleasant Hill reservoir on November 30th, December 5th with Kenyon, Joe Gaffney, City Engineer and Dante Del Prete, Public Works and again December 6th. The purpose of my visits was to ascertain the extent of damage done to existing trees and tree roots after the non-permitted trenching was done for the KOWS radio station tower installation. I had not seen or reviewed plans for this project, and the City had not granted any permits authorizing the work to begin.

SITE HISTORY

In the 1980's after the new water tanks were installed, landscaping and irrigation were installed around the reservoir tanks to provide visual screening. There are many existing Italian stone pines and coast redwoods which were planted at that time. Dante reported that over the years several of the pines have failed due to circling/girdling roots or co-dominant leaders with included bark, defects that originated in the nursery stock prior to installation. Irrigation was discontinued after the trees were all well-established.

PRESENT ISSUE

When the electrical contractor for KOWS went on site last week to excavate a trench for the radio tower, many roots of the mature Italian stone pines and other trees were ripped and broken by the equipment when the contractor dug a 13-15" wide, 3' deep trench for conduit. The length of the excavated trench was approximately 300' with a short section uncompleted near the proposed tower pad location. I inspected all the trees several times and saw many broken roots; a few 2-4" diameter, many ½-1" diameter, and one 6-8" root mass about 5' from a clump of young coast redwood trees near the southeast end of the trench. The root damage was severe on approximately 4-6 trees, and significant on 10-11 trees. I measured some tree and root diameters, and took photos and field notes, as well as establishing a visual level of the damage. Two live branches, approximately 4" & 5" diameter were broken off a large pine near the southwest corner by the equipment. The damage to the trees was egregious and preventable.

ADJACENT PROPERTIES

I inspected the trees planted on the adjacent property to the west; the trench was dug outside the dripline and critical root zones of all those trees. I saw four ½ - ¾" roots broken from the 9" & 9" dbh (diameter at breast height) stone pine at the southeast corner (#1 on the plan provided to the City), a few roots smaller than ¾", and one 1" root from a spruce (#6). None of those

trees is expected to suffer significant impact, if any from the trenching. Their structural stability was not compromised.

Leland cypress trees recently planted near the south property line on an adjacent property did not have any roots extending as far as the trench, and are not expected to suffer any impact from the trenching.

TREE PROTECTION DURING CONSTRUCTION

With plan review and input regarding tree protection this damage could have been avoided almost entirely. A different route outside tree root zones would have been planned, and reportedly had been requested by the City. Typically roots 1-2" and larger are required to be preserved during construction of similar projects. Where work had to occur within tree driplines/root zones, a construction-monitoring arborist would have directed the excavation with various techniques to preserve roots. A combination of Air Spade (high-pressure pneumatic hose) and hand digging is the best technique for avoiding root damage, with arborist-monitored use of small excavators and hand digging the most common when working within tree rootzones. When equipment approaches tree rootzones, usually inside the driplines, the arborist directs the digging until roots are found, then careful hand digging exposes the roots, and conduit or other lines are installed under the preserved roots.

The soil on the site is sandy with few rocks, and the conduit was placed at the bottom of a 3' deep trench. Most of the roots were growing between 2"-24" deep, where 90% of most tree roots grow on typical sites. No roots 1" or larger were seen which couldn't have been avoided and preserved because of their depth or location. There was sufficient room for cover over the conduit and backfilling without damaging roots. No tree protection measures were followed during this work.

CURRENT STATUS OF TREES

The pines and other trees are dormant now and temperatures low with high humidity, with significant rain predicted in the next week. There is no concern about beetles attacking the root-damaged trees in this season, and the roots are slow to dry out in this weather.

Only two trees appear to be at risk of possible failure due to root loss. A 17" stone pine (Tree #5 on the list provided to the City) leans toward one of the reservoir tanks from competition for light. During the trenching it lost several retention roots 4' from the trunk on the west or windward side; one 4" root, one 2" and several smaller roots. If it fell it would hit the tank because of its weight distribution and location, and it should be removed.

The other tree which is at a slightly elevated risk for failure is a 43" dbh stone pine (Tree #10) at the southwest corner. It lost most of its roots on the west/southwest side, approximately 6.5'-8' from its trunk. If it failed, it would most likely fall to the east, away from prevailing winds, having lost retention roots in tension on the west side. It should be removed.

MITIGATING THE DAMAGE

The first thing to be done within the next few days is to have an arborist or qualified tree service provider (under the supervision of an arborist) recut all damaged roots ½" diameter and larger. With loppers for ½" roots, and a sharp pruning saw for those 1"+, the roots shall be cut cleanly across the face of the root past the damaged portion. Where tree trunks are close to the trench on both sides, roots should be cut on both sides of the trench. Small, viable flexible roots shall be left uncut and tucked back into the trench at the time it is backfilled.

No treatment of the cut roots is recommended. Backfilling of the trench should occur within a week of the root re-cutting.

After the trench is backfilled, the two trees to be removed should be taken down. Chips from the removal should be spread on site under the remaining trees. When the 43" pine is removed, the trees behind it wil become the new 'edge trees' and should be closely monitored for structural soundness. Removal of large dead branches (2"+) in those trees and possible remedial pruning will be evaluated, recommended and performed if needed.

MONITORING

There may be signs of decline from the root damage manifested on the affected trees over the next few years. Considering the species, size, soil, site and age of the trees it is most likely that the trees will show decline within the next 2-3 years. Generally when temperatures are high in early summer, after the first flush of new growth, signs of stress will be evident. The most likely symptoms will be branch dieback, often starting with thinning foliage at the tops of the crowns and branches dying successively. It is possible that a couple of the most seriously impacted trees may die. We will schedule site visits regularly for the next two-three years to monitor the condition of all affected trees. If significant decline or branch dieback is noted, the arborist will immediately notify the City and provide recommendations to reduce any hazard and improve tree health. We will note the cause of any future tree failures.

REPLACEMENT TREE PLANTING

Where trees are removed or possibly die, I suggest that they be replaced with 24" box specimens of the native Western red cedar (*Thuja plicata*), coast redwood (*Sequoia sempervirens*), coast live oak (*Quercus agrifolia*) and/or deodar cedar (*Cedrus deodara*). There is room for two trees where the 43" pine will be removed, but no additional screening or tree planting would be needed where the 17" tree will be removed close to the tank. In a separate document I will provide the estimated cost of arborist monitoring of the trees for three years, and estimates for the installed, 24" box trees.

Respectfully submitted,

Becky Duckles

Becky Duckles, City Arborist
ISA Certified Arborist # WE-0796A