JSR Micro Tree Inventory and Sidewalk Modifications

Arborist Report

Prepared for:

JSR Micro

1280 N Mathilda Ave,

Sunnyvale, CA

94089

Prepared by:

Kim Zetterlund

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ISA Tree Risk Assessment Qualified

Updated:

7/21/2020

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Summary

I was contacted by Mark Sakowski, the facilities engineer at JSR Micro located at 1280 N Mathilda Ave. in Sunnyvale, CA to create a site wide tree inventory and arborist report. JSR Micro is selling of a portion of their property and is required by the city to make modifications to the sidewalks around the perimeter of the property on N. Mathilda Ave. and W. Java Dr. The purpose of the inventory is to know the number of trees on the property of what species as well as their overall health, height, and Diameter at Breast Height (DBH) in addition to a more thorough evaluation of the trees that could potentially be impacted by the sidewalk modifications. I used information and drawings from BFK Engineering who performed a survey of the property to determine which trees would need to be looked at more closely. It is these trees that will be the main focus of the report as the majority of the trees on site are healthy and will not be impacted by the sidewalk modifications.

Limitations and Equipment Used

All inspections of trees were done visually from the ground. I used a diameter tape, measuring tap, and GPS mapping application. Each tree was tagged with a nail and hammer.

Observations

The portion southern portion of the property is a large parking lot that JSR Micro is planning to sell. There are 68 trees in this portion of the property. Of these trees there are mostly eucalyptus (*Eucalyptus spp.*), Lombardy poplars (*Populis nigra*), holly oaks (*Quercus ilex*), and valley oaks (*Quercus lobate*). The eucalyptuses are in fair to good condition and are growing mainly in the parking lot islands. They have all been topped in the past, which has impacted their health and structure. Topping a tree puts a lot creates a lot of stress and the new response growth is often very poorly attached. The result of the topping of these trees can be seen in their sparse and low vigor canopies. The risk of future limb failure is also increased due to this pruning practice.

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The southern fence of the property is lines with tall poplar trees that are in either poor condition or completely dead. The back-fence area does not appear to have been maintained for some time as there are many volunteer trees growing in this area and the ivy has grown high up on a number of the tree's trunks.

Moving towards the main building and along N. Mathilda Avenue are multiple redwoods (*Sequoia sempervirens*). All of these trees are in good health and provide excellent shade for the west side of the main building and the sidewalk along the street. There are also some Monterey pine (*Pinus* radiata) dispersed within this group of redwoods. Monterey pines are very susceptible to bark beetles. Bark beetles bore beneath the bark of the tree and feed on the nutrients within the cambium layer. They can also be vectors for disease. Once a tree is infested with bark beetles it is very likely that the tree will die. Nearly every Monterey pine on the property has evidence of bark beetles and will need to be monitored going forward as they will likely begin to decline and die in the next couple of years.
I will discuss a handful of specific trees along N. Mathilda Ave. and W. Java Dr. that are likely to be impacted by the sidewalk modifications later in the report.

At the corner of the property near the intersection of N. Mathilda Ave. and W. Java Dr. is another grouping of redwoods. The trees in this group are not as green as the redwoods along N. Mathilda and their canopies are not as dense. They appear to be water stressed. Unlike the trees along N. Mathilda they do not receive as much shade provided by the building. They are also planted in grass, which soaks up a lot of water before it can reach the roots of the trees.

The front of the main building is landscaped with a variety of trees such as tristanias (*Tristaniopsis laurina*), crape myrtles (*Lagerstroemia*), Japanese maples (*Acer palmatum*), London plane trees (*Platanus spp.*), and deodar cedars (*Cedrus deodara*). These trees are well maintained and are good health. The London plane trees suffer from a common ailment of the

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species, powdery mildew and anthracnose. These are fungal diseases that impact the wood and leaf tissues but is not lethal. It does cause the trees to appear less aesthetically pleasing and healthy with sparser canopies and smaller leaves. The crape myrtles and tristanias are visually appealing trees with colorful foliage and flowers. They also serve as shade and screens for the entrance to the main building.

The trees that would be impacted by the sidewalk modifications are along the outside perimeter of the property on N. Mathilda and W. Java. Currently the sidewalk meanders a bit through the trees and the proposed new sidewalk would run parallel to the street with a 4-foot-wide landscape strip and a 6-foot-wide detached sidewalk along N. Mathilda and a 10-foot-wide attached sidewalk with tree wells on W. Java.

12 redwood trees and 1 Aleppo pine (*Pinus halepensis*) will be impacted by the installation of the new sidewalk and landscape strips. In the drawings provided by BFK Engineering included in Appendix A the trees that will be impacted by the sidewalk installation have been identified with black circles around the tree points. These trees would have to undergo significant root pruning very close to trunk of these trees. The sidewalk would enter into the drip line of each of the trees, some would have the sidewalk directly against the trunk. In addition to these 13 trees impacted by the sidewalk, 7 other trees have been identified to be in poor and declining health and are desired to be removed by JSR Micro. 4 out of these 7 trees are Monterey Pines (*Pinus radiata*) with significant bark beetle infestations. The beetles have progressed through the tree past the point of saving them. The other 3 trees are Eucalyptus in poor health.

Discussion

The main concern for JSR Micro is for the trees that will be impacted by the sidewalk modifications. All other trees on the property with the exception of the 13 on N. Mathilda and W.

Java will not be impacted by this project in any way and therefore I will only be discussing the impacted trees in this section.

In order to install the new sidewalk and landscape strip based on the current drawings provided by BFK Engineering the 13 identified trees will have a significant amount of their roots cut on one side within or very close to their drip lines. This is not advisable as the majority of the root's strength are within the dripline. Cutting of the roots would not only compromise the tree's strength close to its trunk but cut off roots that extend far beyond the tree for water and nutrient absorption. Redwoods in particular do not respond well to such severe root pruning and would experience a significant decline in health and stability as a result. Tree #302 is an Aleppo pine along W. Java that already has a pronounced lean towards the street over the sidewalk. Cutting the roots of this tree for the sidewalk modifications will increase its risk of failure while also negatively impacting its overall health.

The other issue will be changes in grade. There are 8 trees on N. Mathilda growing many inches above the grade of the current sidewalk in a raised grass area lined with stacked bricks along the sidewalk. Cutting the roots will destabilize the trees and then they will also be perched on an edge directly next to the new sidewalk. The difference in grade between the trees and the sidewalk will increase the likelihood of whole tree failure for these 8 trees as an entire side of the trees would have their roots and soil removed.

For the remaining 5 trees soil compaction for the sidewalk installation will hinder new root growth. Soil compaction is necessary for the construction of the new sidewalk but it also creates a very difficult environment for trees roots to grow. After a tree's roots are pruned the tree will try to replace those roots as much as possible. For mature trees replacing the larger diameter support roots may never take place but smaller diameter roots can grow in an attempt to find water and nutrients. These smaller roots will struggle to work their way through the compacted soil.

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Based on the current drawings and plans for the new sidewalk there is no way to avoid significant damage to the 13 identified trees. The sidewalk construction would be too close for these trees to not be impacted and there are no mitigation options available. Redwoods do not do well in construction zones and this project would take place exceptionally close to the trees. The trees may not die due to the project but they will be significantly destabilized and will likely be stressed and unhealthy for many years to come. The potential risk for whole tree failure is of concern for these trees in the future as well.

Either these specific trees are removed prior to the project and replaced or the sidewalk designs are changed to where root pruning does not occur so close to the trees. The last option would be to continue with the current plans and evaluate the trees for how they respond over time, this last option is not advised.

The 4 Monterey pines that are shown on the BFK Engineering maps with an X through their tree point have been slated for removal due to the significant bark beetle infestation that has gone past the point of saving the trees. These trees are showing signs of decline in the form of orange flagging/dead branches throughout their canopies and numerous pitch tubes at the bases of their trunks. The trees will not survive the infestation and there are no treatment measures that would eradicate the beetles and increase their vigor. The trees should be removed.

The 3 Eucalyptus have also been selected for removal because of their significant decline in health. They are large trees with sizable canopies that are showing signs of decline. The canopies are sparse with significant amounts of deadwood. As they continue to decline the trees would also become liabilities. It is my recommendation that these trees be removed.

Conclusion

The proposed plans for the sidewalk modifications will significantly impact the 13 trees identified. There is no way to mitigate damage to these trees given how close to the trunk of the

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trees root pruning would occur. The trees will be destabilized and stressed as a result of the root pruning. 8 of the 13 trees will have added issues due to significant differences in grade between the sidewalk and their growing site, an element that would increase tree instability. Redwoods and pines are sensitive to actions that impact their roots and will likely decline in their health as a result of this project if it follows the proposed plans.

The 4 Monterey pines and 3 Eucalyptus will become hazards and liabilities to the property and should be removed.

JSR Micro is opting to pay in-lieu fees instead of planting new trees on-site.

X_____

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Tag #	Species	DBH	Private or Public Tree	Remove or Remain	Reasons for removal
101	Redwood	10.5”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.
103	Redwood	12.8”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.
104	Eucalyptus	15.8"	Private	Remove	Declining in health.
106	Red Iron Bark Eucalyptus	15.9"	Private	Remove	Declining in health.
107	Eucalyptus	25.2”	Private	Remove	Declining in health.
112	Redwood	17.2”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.
113	Redwood	19.9”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.
117	Pine, Monterey	35.8”	Private	Remove	Declining health. Significant bark beetle infestation. Tree will not survive and will become a liability.
118	Pine, Monterey	12.7”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur. Infested with bark beetles. Declining health.
126	Pine, Monterey	22.0"	Private	Remove	Declinging health. Significant bark beetle infestation. Tree will not survive and will become a liability.
127	Redwood	15.6”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.
136	Redwood	3.3”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.
141	Redwood	3.1”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.
142	Redwood	2.6”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.
143	Redwood	15.8”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.

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148	Redwood	25.9”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.
302	Pine, Aleppo	18.0”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.
306	Pine, Monterey	18.8"	Private	Remove	Declining health. Significant bark beetle infestation. Tree will not survive and will become a liability.
318	Redwood	19.5”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.
319	Redwood	19.8”	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.

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Photos

See Below

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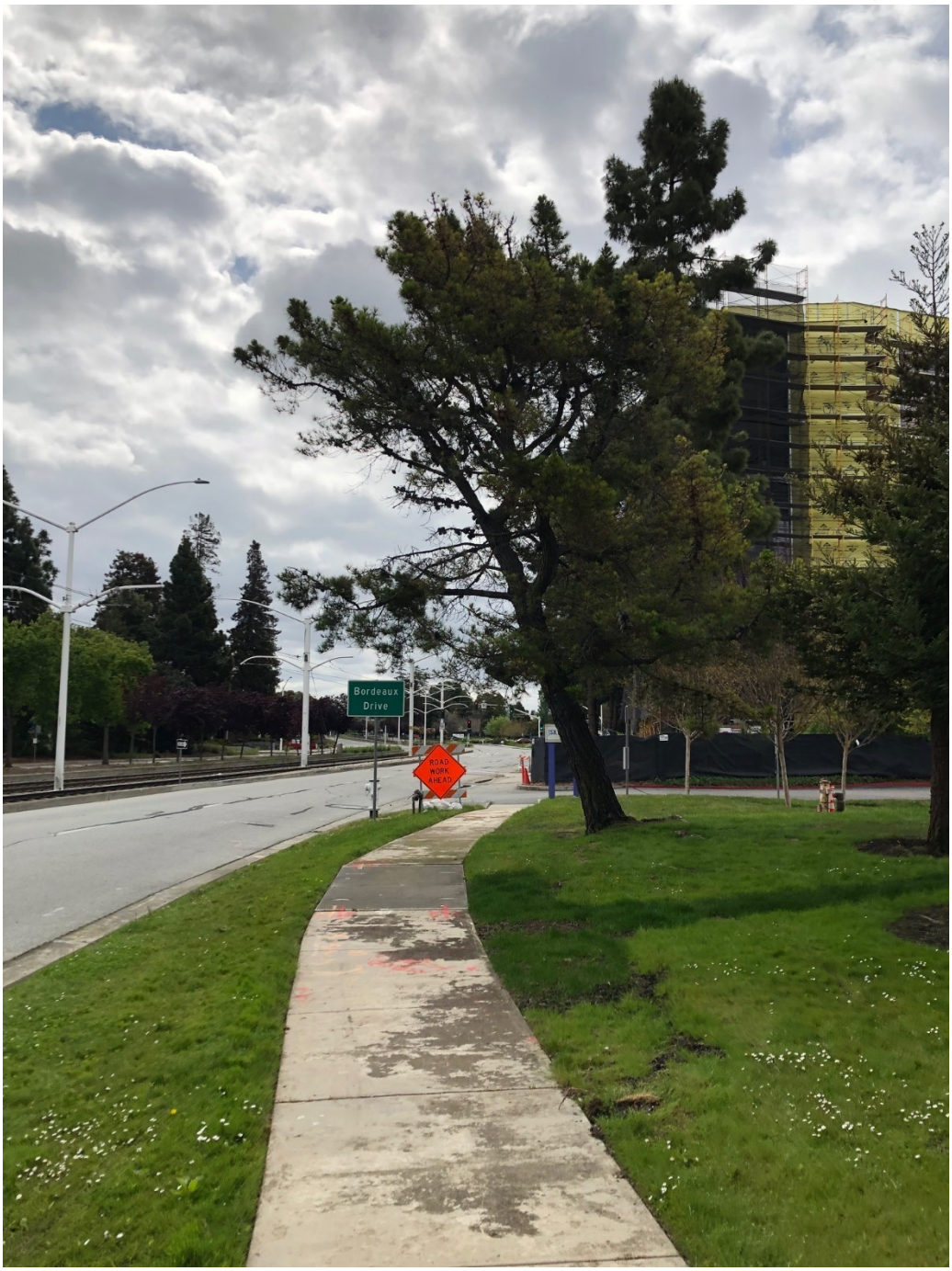

Tree #302 Aleppo pine with significant lean that would have roots cut very close to its trunk

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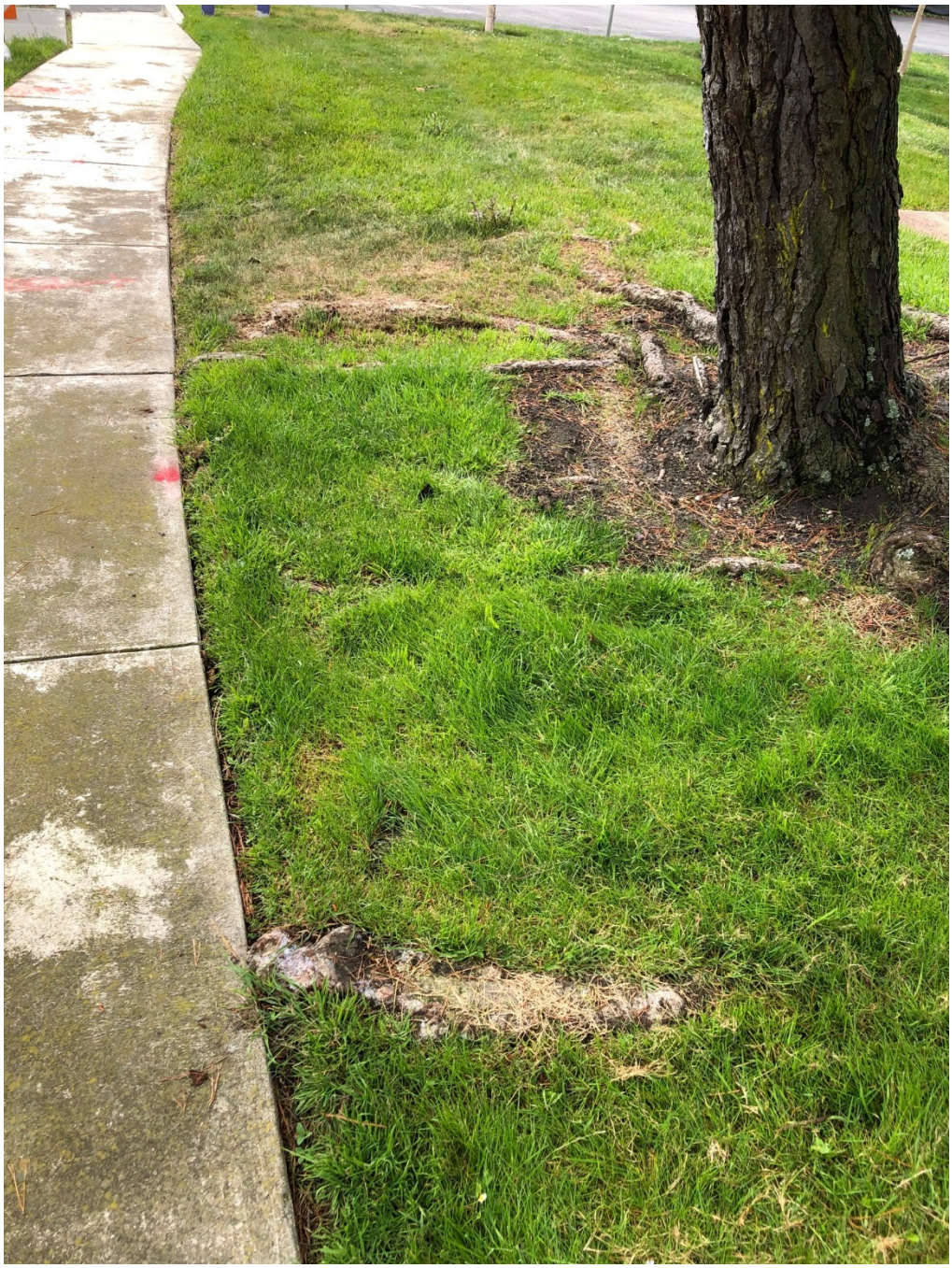

Tree #302 close up photo showing the size and amount of surface roots that would need to be cut.

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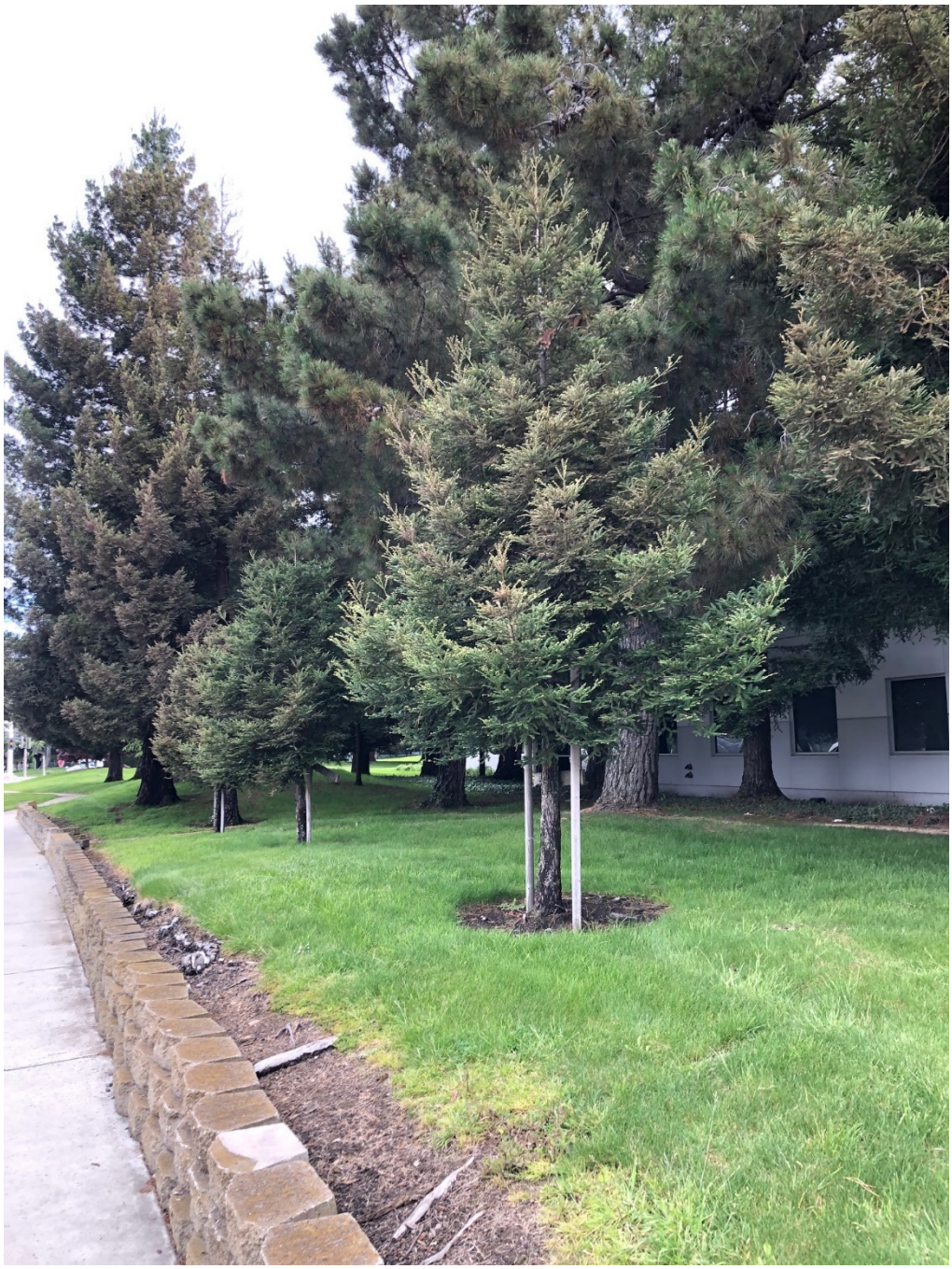

Tree # 136, 141, 142 visible in raised grass area with staked bricks showing current difference in grade between trees and sidewalk

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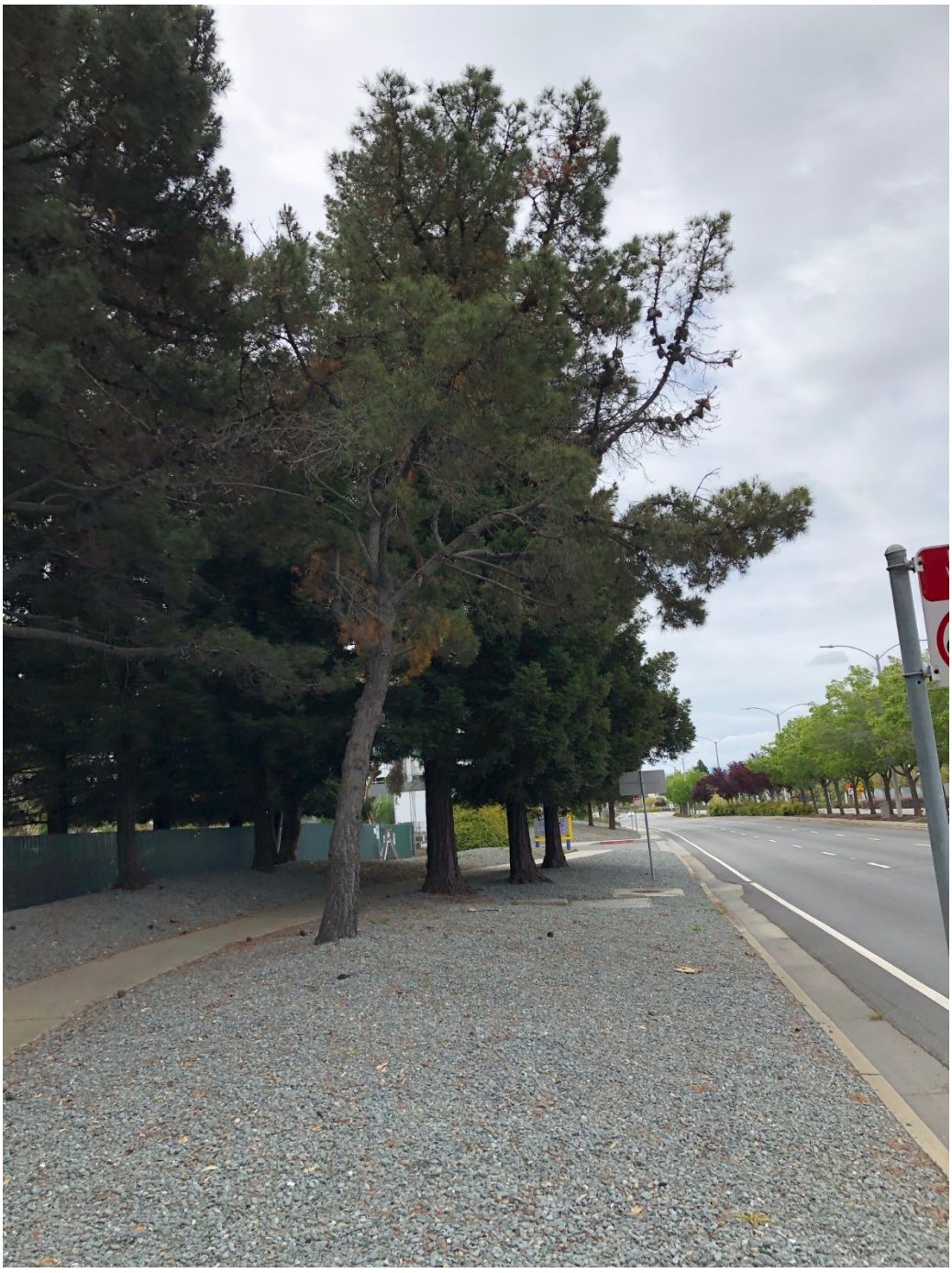

Tree #118 Monterey pine. Tree is infected with bark beetles. Orange flagging on lower branches is an indicator of bark beetles and the trees health decline

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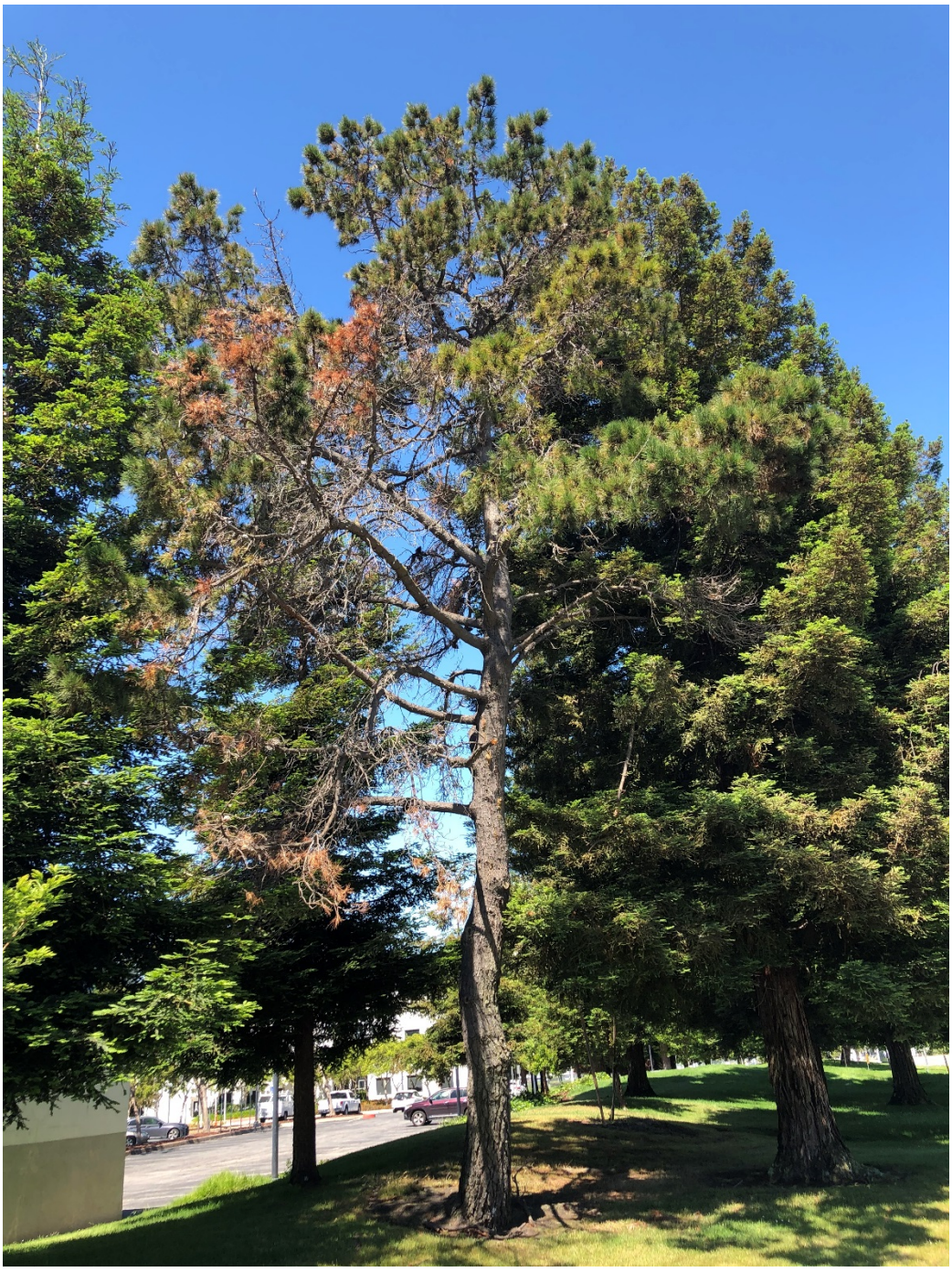

Tree # 306 Monterey Pine. Tree is nearly dead from bark beetle attack.

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JSR Micro Sidewalk Modifications - Proposed Tree Removals

(ammended 1/7/2020)

Arborwell
Employee-Owned Tree Management

Tag #	Species	DBH	Private or Public Tree	Remove or Remain	Reasons for removal	# of 24" Box Replacement Trees
104	Eucalyptus	15.8"	Private	Remove	Declining in health.	1
106	Red Iron Bark Eucalyptus	15.9"	Private	Remove	Declining in health.	1
107	Eucalyptus	25.2	Private	Remove	Declining in health.	4
117	Pine, Monterey	35.8	Private	Remove	Declining health. Significant bark beetle infestation. Tree will not survive and will become a liability.	4
118	Pine, Monterey	12.7"	Private	Remove	Too close to new sidewalk. Significant root pruning to occur. Infested with bark beetles. Declining health.	1
126	Pine, Monterey	22.0"	Private	Remove	Declinging health. Significant bark beetle infestation. Tree will not survive and will become a liability.	2
136	Redwood	3.3"	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.	0
141	Redwood	3.1"	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.	0
142	Redwood	2.6"	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.	0
302	Pine, Monterey	18.0"	Private	Remove	Too close to new sidewalk. Significant root pruning to occur.	1

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