



Class One Arboriculture
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December 24, 2015

Redacted

Redacted

On December 21, you sent me an assignment to inspect ***Redacted***. You asked me to inspect and identify the tree in the front yard of the property and to determine if it was responsible for the damage to the driveway of the adjacent property at ***Redacted***. My observations indicate that the tree caused the displacement of the western portion of the driveway.

Site Observations

Clients ***Redacted*** met me on site on December 24th, 2015 at 2:30pm. They showed me the subject tree and the damage to their neighbor's driveway. Subject tree is *Liquidambar styraciflua*, a Sweet Gum tree. It is approximately 35 feet tall, and has a DBH of 16 inches.

The subject driveway shows evidence of strong displacement. A portion of the driveway has lifted by as much as 1.5 inches, and another section near the garage door has lifted far enough to prevent the garage door from being opened.

The center of the subject tree is approximately 5 feet from the eastern property line and 17 feet from the subject driveway at its closest point. The driveway is within the root zone of the tree, and surface roots further illustrate the extent of the root zone. Typically, roots can be found within a radius of 1-2 times the height of the tree. This pattern suggests that the subject tree caused the driveway displacement on the western portion of the driveway.

There is only one other tree adjacent to the damaged driveway. This *Afrocarpus falcatus* is growing in the street median strip to the north of the driveway and is showing evidence of lifting portions of the pavement as well. The pattern of concrete displacement indicates that both the *Afrocarpus* tree and the *Liquidambar* tree are causing the driveway to lift in different places. The *Afrocarpus* appears to be displacing the north and eastern portions of the driveway, and the *Liquidambar* tree appears to be displacing the southwestern portion of the driveway. The displacement is greater closer to each respective tree, ranging from 1.5 inches displacement near the trees down to 0.5 inches displacement about 10 to 20 feet further away.

A portion of the driveway was obscured from my view by a truck parked in the driveway. I was told that the truck was not functioning and could not be moved so I made observations to the best of my ability under the truck. It appeared that the driveway displacement continued under the truck because a continuation of the displacement line appeared on the other side.

Liquidambar styraciflua is commonly known among arborists for its shallow and strong roots that can lift and buckle hardscape such as sidewalks and driveways. I have also anecdotally known *Afrocarpus falcatus* to cause damage to hardscape.

Immediately adjacent to the driveway, there is a shrub of *Rhaphiolepis indica* mixed with a small sprout of *Nandina domestica*. Neither of these are root-aggressive plants, and it is unlikely they caused the driveway displacement. The displacement is greater on the section of the driveway nearer to the *Liquidambar* tree and further from the shrub, suggesting the shrub is not the cause of the problem.

The subject tree is in good health. It has evidence of a normal shoot tip extension rate. There are two tear-out wounds from medium branch failures in the past. The tree appears to be tolerating these injuries, and they have a negligible or no effect on the growth rate of the root system.

Site History

Clients ***Redacted*** told me they have lived at their property for the past 20 years. About 2 years ago, their neighbor mentioned that the driveway was lifting. He showed ***Redacted*** an existing crack in the driveway and asked ***Redacted*** to remove the *Liquidambar* tree.

Redacted contacted their homeowners association asking for permission to remove the tree, and the HOA responded that they were required to replant if the tree was removed.

Redacted took no further action. Neither did the neighbor. No further discussion on the subject took place until 2015.

Recently, the neighbor showed the driveway displacement again to ***Redacted*** and demonstrated that he was unable to open his garage. He told ***Redacted*** that the homeowners association was requiring him to repair the driveway.

Redacted told me that she had maintained her lawn herself up until about 4 years ago when she and ***Redacted*** hired a gardener. She told me that there had not been significant surface rooting while she was caring for the lawn. After she hired the gardener, she did not pay attention to the tree roots, and she only noticed the surface roots once they were pointed out to her by the neighbor.

Conclusion

The western portion of the subject driveway was displaced by the roots of the subject *Liquidambar* tree. *Redacted*knew that their tree was posing a problem to their neighbor's driveway 2 years ago when they were told about the displacement. The displacement occurred gradually over a period of approximately 5 to 7 years. Significant displacement was apparent 2 years prior to the claim, and additional displacement occurred in the last 2 years.

Limitations

The conclusions in this report are based upon my site inspection on December 22, 2015. I relied entirely upon visual observations. I did not conduct any excavation to confirm the locations of the roots of the subject trees. Root paths cannot be known exactly without excavation, but surface observations and plant knowledge can give a good approximation of the root system.

I relied upon the accuracy of the information provided to me by the clients. If any of the information provided to me is found to be incorrect, the conclusions in this report may become invalidated.

Please let me know if you have any questions,

James Komen
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Site Photos



Figure 1: Site map showing the subject *Liquidambar* tree (yellow), the neighboring *Afrocarpus* tree (magenta), and the driveway displacement observed by each tree respectively. The property line is shown as a red dashed line.



Figure 2: Looking south at the subject *Liquidambar* tree. The driveway displacement is highlighted in yellow. The *Raphiolepis* shrub is next to the garage. It is not likely that this shrub caused the driveway displacement. The displacement in the middle of the driveway (far left) was approximately 1.5 inches, and the displacement nearest to the garage was approximately 1 inch.



Figure 3: Looking southeast. The next closest tree to the neighbor's driveway is the *Afrocarpus* tree (left) growing in the street median. It appears to be causing the concrete displacement highlighted in magenta.



Figure 4: Close up of the displacement in front of the garage door. The displacement of the concrete is approximately 1 inch, making it impossible to open the garage door. The surface root seen at the center of the photo is not likely from the *Rhaphiolepis* shrub. Rather, this is likely a surface root from the subject *Liquidambar* tree.



Figure 5: Close up on the displacement towards the middle of the western portion of the driveway. The displacement is approximately 1.5 inches.



Figure 6: Surface roots of the subject *Liquidambar* tree. These roots became apparent above the soil level in the last 4 years according to the client.